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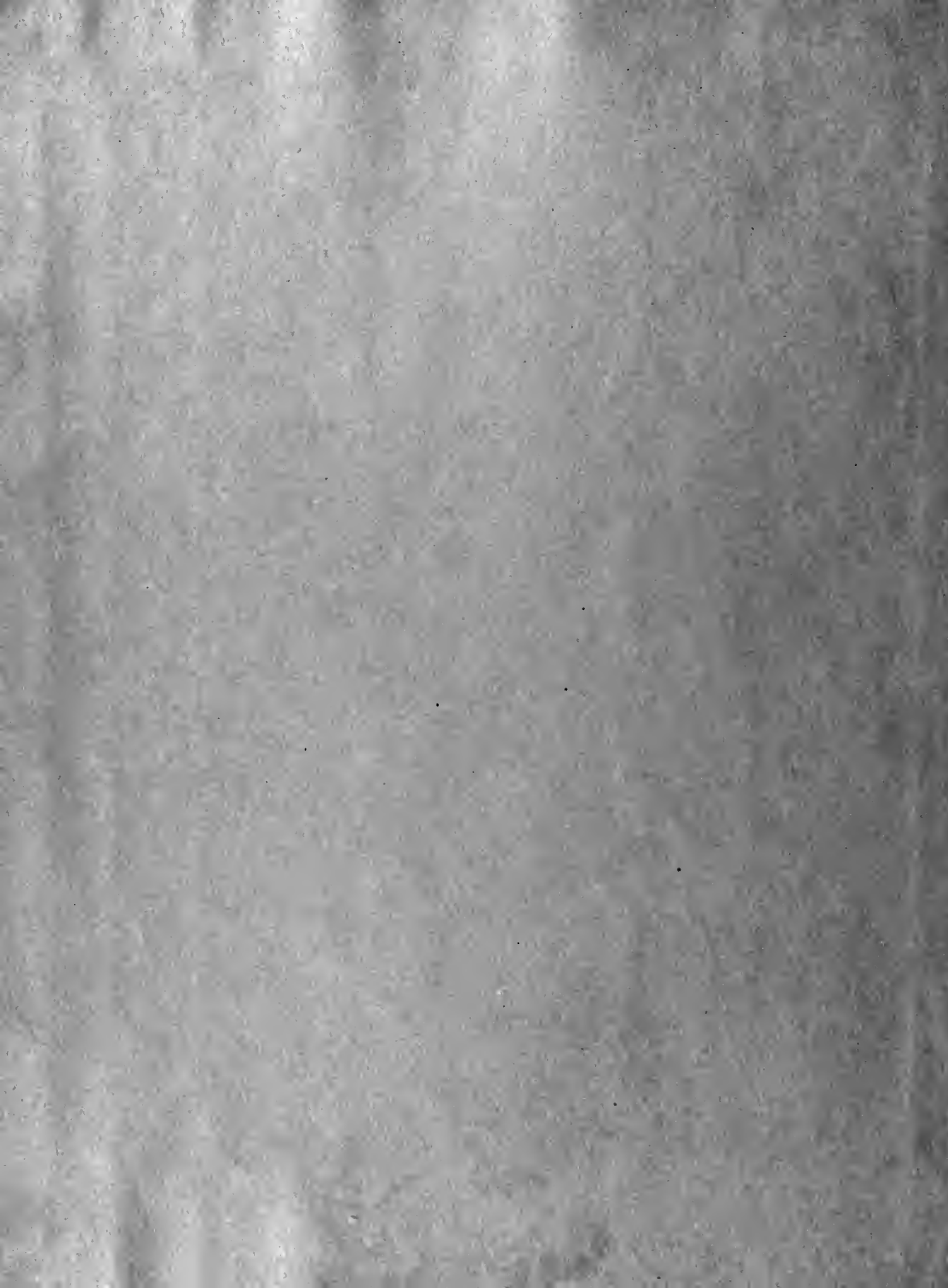
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# NEW RECLAMATION ERA

VOL. 16

JANUARY, 1925

NO. 1



Photo by Army Air Service

## AMERICAN FALLS DAMSITE

AN AEROPLANE VIEW OF THE SITE WHERE THE GREAT AMERICAN FALLS DAM WILL BE CONSTRUCTED  
BIDS FOR THE CONSTRUCTION OF WHICH WILL BE OPENED IN JANUARY

*RECLAMATION*, stressed in the President's message you have heard read, is one of the greatest problems for the future of the West, and therefore for the future of the country. The placing of men upon land which they themselves own and they themselves till is the surest foundation for a democracy, and I am a great believer in the program of reclamation for the West. But my contact with it during the past three years and more—during which time I have visited nearly all of the great reclamation projects and during which time I have had charge here of the appropriations for carrying on the work—has impressed me with this fact: That the welfare of the West and the welfare of the country as bound up in the policy of reclamation demands that it is absolutely necessary that this whole program be now put upon a business basis. It must be taken out of politics. Projects must be selected not through political logrolling but upon the basis of merit and with reference to the opportunity there is for each project to succeed and make good.

—Extracts from speech by Hon. Louis C. Cramton before  
the House of Representatives on December 3, 1924.

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

JANUARY, 1925

No. 1

## SECRETARY WORK OUTLINES FUTURE RECLAMATION POLICY

*In letter to the President, the Secretary of the Interior calls attention to needed changes in the reclamation law and outlines methods and measures tentatively adopted by the department*

THE SECRETARY OF THE INTERIOR  
WASHINGTON

December 11, 1924.

THE PRESIDENT,  
The White House.

MY DEAR MR. PRESIDENT:

The time has arrived for the adoption of a broad program of reclamation development. Reclamation legislation recently enacted by Congress will improve the condition of settlers and make it possible for them to meet their payments to the Government in the future. It omits, however, certain required features to supply which additional legislation is needed, which will:

(a) Define the policy and procedure with respect to cooperation between the Federal Government and the States in the development of new projects;

(b) Provide for amortized payments with a low rate of interest, on advances made by the Government for the development of farms;

(c) Bring about the adoption of a unified plan for the colonization and closer settlement of land in excess of homestead units, held in private ownership.

I suggest that Congress be invited to appoint a joint congressional committee to consider these questions, with a view to drawing up a reclamation code which will constitute a policy and working plan for existing projects and future development. To this end I have outlined herein certain methods and measures which this department has tentatively adopted.

### EXISTING PROJECTS

1. The obligations of settlers on existing projects should be adjusted and a basis provided for future payments. This will require a reappraisal of areas to determine their ability to produce profitable crops under irrigation.

2. The Government has expended a large amount of money in the construction of reservoirs which are only partly used, with a consequent heavy loss of

income. There are other projects where storage is needed to utilize the distributing works. A definite construction program for the completion of works needed to secure the full benefit of the Government's investment and complete utilization of the resources on these projects should be adopted.

3. The management and control of existing works should be transferred to the water users, where they are in a position to organize and to be entrusted with this authority, the form of such organization to be that of an irrigation district operating under State laws.

### FUTURE DEVELOPMENT

4. All investigations of future projects should include a comprehensive study of legal, engineering, economic, agricultural, and financial conditions. Legal studies are needed to determine the title to water rights; engineering studies to determine the cost of irrigation works; economic studies to determine the value of land held in private ownership, the outlay required to change raw land into farms, and the character of markets; agricultural studies to determine the crops suited to the locality and the productive value of water under irrigation; financial studies to determine sources of credit, interest rates, and cost of settlement and farm development. The results of these investigations should be submitted to Congress and to the authorities of the State in which the development is located.

5. On all projects undertaken hereafter the State in which the development is located should participate in the selection of settlers and the development of farms. The States should not be required to contribute to construction costs, but should be required to contribute to the fund provided for advances to settlers for farm development, as they now contribute to the construction of roads and to agricultural education.

6. A fund should be provided from which money can be advanced to help

worthy, needy settlers improve and equip their farms. Such advances should bear interest and, for permanent improvements, should extend over long periods. Four per cent is suggested as the interest rate.

7. There are almost as many farm laborers as farm owners in this country. The conditions under which the families of farm laborers live are, therefore, a matter of great importance. Provision should be made on these projects to give the farm laborer an opportunity to acquire a home and a garden, the number to be limited to the local demand for hired labor. In this way we will train up the farm owners of the future.

8. Provision for advice and direction to settlers in the development of their farms and in working out plans of marketing and cultivation, should be a feature of all new development.

### GENERAL

9. The plans for future reclamation development must take into consideration the needs of the different States, the water-right problems of interstate streams, the amount of the reclamation fund which will be available during the next 20 years. The construction of reservoirs by the Bureau of Reclamation under a forward looking plan of this character will be an effective agency for lessening controversy and securing an equitable distribution of the water supply.

10. Efforts to reach an agreement for the economic apportionment of water of interstate streams, now being made by the States, have the cordial approval and support of this department. It is infinitely better than the costly and unsettling litigation certain to arise unless such agreements are reached. It ought to be possible under such agreements to work out plans for the storage and regulation of the water of the Missouri, Colorado, Platte, Rio Grande, and Columbia Rivers and their tributaries.

(Continued on page 2)



## NEED FOR GENERAL REVISION OF THE RECLAMATION ACT

*Commissioner Elwood Mead points out that revision of the reclamation act is a prerequisite to the success of future reclamation, and outlines the fundamental changes necessary*

I BELIEVE that the future success of reclamation will be promoted by a complete revision of the reclamation act. Many things indispensable to the adjustment of project costs and to the prompt and successful colonization of the land are not included in the act recently passed by Congress. Among the matters which should have consideration are the following:

(a) The Bureau of Reclamation should have its duties and responsibilities more clearly defined. At present the bureau is a creation of the Secretary to enable him to carry out the duties imposed by Congress. The extent of the commissioner's authority and the policies which control the bureau change with the views of different secretaries. Such an arrangement is not favorable to continuity of action or the carrying out of a long-time program of development. Giving the bureau definite authority and responsibility would relieve the Secretary of a burden that is destined to become far more arduous in the future.

(b) The time has come for considering requiring interest payments on the construction costs of all new projects. If this were done, it would put reclamation on a business basis. It would end the favoritism that is now shown the owners of private land in the development of

their properties with interest-free money. It would tend to stop the inflation of prices of unimproved land which has been a continuing abuse in the past and has often prevented realizing the desirable social and economic purposes of the act. If interest is paid, it does not greatly matter when payment begins on the money spent on the works. They could remain the property of the Government until irrigators were ready to assume control and if the interest rate were made low, say 3 or 4 per cent, no additional burden would be imposed on the settler of small means. On the contrary, it might improve his condition, as he now sometimes pays twice for his water right, once to the Government, and again in high land prices and high interest rates on borrowed money.

(c) The increased cost of works and the large amount of money which has to be spent in changing unimproved land into habitable farms make the methods of colonization and farm development matters of first importance. Provision should be made for soil surveys, appraisal of prices of farms according to productive value, whether the land is the property of the Government or excess holdings of private owners. The qualifications of settlers should be scrutinized. There must be publicity to call attention

to the opportunities of these projects and a farm development program to aid the beginner in his development. These things are necessary to bring under cultivation abandoned farms on old projects, check the unhealthy increase in tenancy, and insure the prompt settlement, development, and payment of charges on all new projects.

(d) This law ought to be an opportunity for home ownership for the settler of small means. If it is to be this, a fund must be provided from which advances can be made to help in the improvement and equipment of farms of selected settlers who lack all the capital required. We now appropriate immense sums of money to be repaid without interest, for the construction of works which improve the landed possessions of private owners, but we do nothing to help the farmer of small means become the owner of that land. Our terms of payment for works are the most generous of any country. Our aid to the settler and for farm development is the least. The time has come for a reversal of the objects of the Government's liberality.

(e) It is believed that the law should require State approval and State cooperation in the case of all new projects. This is now required in the building of highways and in agricultural extension. Doing this will bring to this complex task a knowledge of local conditions possessed by the State, will arouse the effort and interest of the people most concerned in the success of these new communities, and will lessen the burden on the Federal fund. Now the law not only does not require State effort but gives no opportunity for the exercise.

## SECRETARY WORK OUTLINES POLICY

(Continued from page 1)

Such action on the Colorado is urgently needed to protect the Yuma reclamation project from danger by floods, and the Imperial Valley irrigation district in California from being devastated both by floods and drought.

11. The primary purpose of all reclamation construction is to extend irrigation. In all stages there will be incidental benefits to come from the development of power. Whatever arrangements are made for such power development, or its distribution, there should be such control by the Government as to prevent interference with the use of the stored water in irrigation.

### RECLAMATION OF SWAMP, CUT-OVER, AND NEGLECTED LAND

12. The reclamation act recently passed by Congress authorizes an appropriation

of \$100,000, to be used in part for reclamation investigations in sections of the country outside of the arid region. It is believed that there is a field for the closer settlement and creation of prosperous homes on areas of neglected swamp or cut-over land. The methods of colonization and the economic conditions under which these new communities will be established are of special importance. All such investigations should be cooperative, the State to contribute one-half of the cost. It is believed that States like North Carolina and South Carolina, which have commissions dealing with settlement, will welcome such cooperation and that such action will promote rural progress in sections where it will be of national advantage.

Very truly yours,

HUBERT WORK.

### COL. BENJAMIN F. FLY HANDS OUT MESA FRUIT

Accompanied by Hon. Henry F. Ashurst, United States Senator from Arizona, Col. Benjamin F. Fly, of Yuma, a frequent and welcome visitor at the Washington office of the Bureau of Reclamation, added fame recently to his "beloved Yuma Mesa" by presenting President Coolidge with an 80-pound box of grapefruit and oranges, and similar boxes of concentrated Arizona sunshine and sweetness to Secretary Work, Secretary Hoover, and Commissioner Mead.

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# ECONOMIC PHASES OF OWYHEE PROJECT, OREGON-IDAHO

*Committee of agricultural and economic experts concludes that project is feasible if development is carried on under provisions of revised reclamation act*

## INTRODUCTION

THE investigations were made at the request of the Division of Farm Economics of the Bureau of Reclamation. The committee was instructed to investigate the economic and agricultural phases of the Owyhee project and report to the Bureau of Reclamation its conclusions and recommendations.

A committee was selected consisting of Mr. A. T. Strahorn, soil surveyor, Bureau of Soils, Washington, D. C.; Prof. M. R. Lewis, agricultural engineer, University of Idaho, Moscow, Idaho; Prof. G. R. McDole, soil technologist, University of Idaho, Moscow, Idaho; and Prof. W. L. Powers, soil technologist, Oregon Agriculture College, Corvallis, Oreg. The committee was assisted in assembling these data, and by conference, by Messrs. J. B. Bond, superintendent, Boise project, Idaho; W. H. Blackmer, assistant engineer, Bureau of Reclamation; E. O. Larson, assistant engineer, Bureau of Reclamation; G. H. Hogue, assistant engineer, Bureau of Reclamation; F. O. Youngs, scientist in soil survey, Bureau of Soils, Washington, D. C.; Dr. R. E. Stephenson, division of soil technology, Oregon Agriculture College; H. L. Holgate, chief field counsel, Bureau of Reclamation; and J. C. Marr, senior drainage engineer, Bureau of Public Roads.

A committee of local citizens residing within the boundaries of the Owyhee project, consisting of Mr. Ivan E. Oakes, chairman, engineer, Ontario; Mr. H. B. Cockrum, banker, Ontario, and Mr. Dick Tensen, farmer, Nyssa, Oreg., were appointed to review this report and submit its findings to the Bureau of Reclamation.

Mr. Youngs and party began the soil survey of the Gem District on July 28, and Professor Powers and Doctor Stephenson began the soil survey of the Dead Ox Division at the same time. Mr. A. T. Strahorn took charge of the soil survey work on July 30, 1924.

Prof. M. R. Lewis carried out the investigations of the economic conditions of the various pump districts, and Professor McDole, Mr. Blackmer, and G. C. Kreutzer collected data on the agricultural and economic phases of the district. Messrs. E. O. Larson and G. H. Hogue carried out the field work on drainage investigations, and were assisted in conference by Mr. J. C. Marr. Mr. H. L. Holgate, chief field counsel of the Bureau of Reclamation, conferred with the direc-

tors of the irrigation district and with other groups of citizens not yet organized into districts, and spent some time conferring with the committee on the legal phases of the project.

During the time that field work was in progress, the local citizens of the communities assisted in every way possible. Messrs. E. C. Van Patton, Pat Gallagher, W. H. Doolittle, County Agent L. R. Briethaupt, all of Ontario, and Mr. J. H. Lowell of Caldwell, Idaho, gave liberally of their time to further investigations. In some instances they furnished cars to carry investigators to various parts of the project.

The scope of the work consisted in making the soil survey and land classification, economic analysis of the pump districts, the study of drainage conditions, collection of data on yields and prices of the principal crops now grown in the section, as well as making balance sheets, inventories, and gathering such other data as was found necessary to determine the feasibility of the project from the economic viewpoint.

The committee was instructed to make such field investigations, and to collect such data, in order that it could finally summarize its findings, having in mind the provisions of the bill H. R. 9559, already passed by the House of Representatives and now pending in the Senate.<sup>1</sup>

## CONCLUSIONS

1. The land classification data show an area of 58,859 acres of first-class land that is well adapted to produce satisfactory yields of all crops that may be successfully grown in the region under consideration. There are 56,140 acres of second-class land that can not be expected to produce as high an average yield as the lands of the first class. It has been assumed that the second-class lands will have an aver-

age productivity of about 75 per cent of that produced by the lands of the first class. Some of the lands in the second class may, after a period of years, attain an increased productivity either through the operation of effective drainage measures or by the use of special crops that experience may show to be unusually well adapted to the soils. Under such conditions, the acreage of lands that would reach full productivity would be slightly increased over that now given for first-class lands.

2. The nonirrigable area of the project is 43,568 acres. There is a remote possibility that a small part of this area may eventually be brought into a productive condition, but to determine such possibilities would require a very complete and extended investigation extended over a long period of time. Studies of that character can not be carried out at present, and the difficulties attending the reclamation of these soils are so great that the land is considered as entirely nonirrigable.

3. There are about 4,000 acres of new land under the Owyhee Canal that were not covered by the present investigation. Assuming that the conditions on these tracts are similar to those in the nearby districts, and that the tracts were supplied with water from the proposed canal, the total irrigable area of the project would be increased to about 117,951 acres.

A summary of the irrigable and nonirrigable acreage in each of the divisions of the project is given in the accompanying table.

5. The soil survey gives 115,000 acres of irrigable land, and there are 8,460 acres under the "shoestring," and other small pumps near Ontario, and 4,100 acres scattered land under the Owyhee ditch without water right, and 12,000 acres under the Owyhee ditches receiving a partial water supply. Hence, the total area to be supplied is 139,560 acres.

(Continued on page 4)

*Owyhee project land classification summary*

Division	Irrigable land (acres)					Nonirrigable land (acres)			
	Area project	First class	Second class			Total	Topography	Soil	Drainage
			Topography	Soil	Drainage				
Dead Ox Flat.....	39,306	23,832	6,421	-----	80	30,333	6,243	2,099	631
Mitchell Butte.....	41,126	11,197	16,850	-----	80	28,127	11,625	-----	1,374
Kingman.....	11,688	4,622	2,550	-----	790	7,962	2,859	-----	415
Succor Creek.....	66,447	10,208	6,051	16,106	7,212	48,577	8,980	3,534	5,356
Total.....	158,567	58,859	31,872	16,106	8,162	114,999	29,707	6,085	7,776
									43,568

<sup>1</sup> Act approved Dec. 5, 1924.

## LOCAL COMMITTEE GIVES STRONG INDORSEMENT

*Believes that, if constructed in conformity with recommendations of Fact Finding Committee, the project will be an outstanding success and a creditable monument to reclamation*

(Continued from page 3)

(These figures may change somewhat when soil data are finally compiled.)

6. Eighty thousand nine hundred and sixty acres of new land and 46,600 of old land in pump districts will receive a full water right; 12,000 acres under Owyhee ditch will receive a partial water right.

7. The total estimated cost of the project is \$17,404,000, divided as follows \$139 an acre for new land not now supplied, \$126.50 an acre for lands in pump districts, and \$25 for lands under the Owyhee ditch.

8. The duty of water is determined to be 4.6 acre feet diverted and 3.22 acre feet delivered.

9. Drainage work will be needed to the extent of approximately \$993,000. The most serious situation is in the Gem unit where 26,000 acres are involved. The \$993,000 is included in engineer's estimate.

10. Future drainage investigations are necessary.

11. Forty-six thousand six hundred acres now receive water from pumps at an annual charge of from \$3.38 an acre to \$11 an acre.

12. The Gem District, because of seeped area, is in need of immediate relief.

13. The cost of leveling land and clearing is from a few dollars an acre to \$60 an acre.

14. The climate is mild—maximum 113°, minimum -26°, mean average 51°; length of growing season 144 days; rainfall 11 inches.

15. Alfalfa, red clover, pastures, corn, and other small grains do well. Apples and prunes are the chief fruit crops. Head lettuce and celery are grown considerably.

16. Average yields on first-class land are: Wheat, 40 bushels; barley, 55 bushels; corn, 50 bushels; clover seed, 5 bushels; alfalfa, 4 to 5 tons; and potatoes, 250 bushels. On second-class land it is estimated to be 75 per cent of the above.

17. Several marketing organizations operate throughout the section, chiefly packing and selling fruits and vegetables. A large cooperative creamery is at Payette. Freight rates are high to distant markets, which makes it advisable to produce concentrated products.

18. Farm units should be a maximum of 80 acres and be of all sizes to 20 acres. Size and shape should depend on soil, topography, and the settler. Generally from 40 to 50 acres will be sufficient.

19. Generally 40 acres, in which one-half to two-thirds are planted to clover,

alfalfa, and pasture, and the balance to corn, potatoes, and wheat, in varying proportions, will prove most satisfactory. Livestock should be kept to consume the feed grown.

20. A good farm unit under such a plan should produce, when fully developed and stocked, as much as \$60 an acre. The average will be about \$45 an acre, and on second-class land \$35 an acre.

21. The land ownership is as follows: State land, 5,000 acres; Eastern Oregon Land Co., 10,000 acres; other private lands in small areas, 47,960 acres; public lands not patented, 18,000 acres; under Owyhee ditch, 12,000 acres; and in pump districts (average size of holding 59 acres), 46,600 acres.

22. Land values were difficult to ascertain. Brush land is held at \$5 to \$40 per acre. Improved land under irrigation is valued at \$100 to \$150 an acre.

23. Taxes are reasonable, being 31½ mills average on a value of \$70 for improved land, or \$2.20 an acre.

24. About 75 per cent of the farms are mortgaged, but generally not more than \$50 an acre. Most of the mortgages are held by the Federal Land Bank of Spokane. Banks charge 10 per cent on short-time loans. There seems to be no shortage of such credit.

25. A 40-acre farm fully developed and equipped will cost about \$7,500 from sagebrush to full production.

26. A good settler with \$5,000 and a loan of \$2,000 from the land bank will have a very solvent undertaking.

27. A settler with \$2,500 will generally have great difficulty without assistance other than is now provided.

28. A settler with \$2,500, taking a farm all cleared and one-half planted to alfalfa and pasture, can, with the aid of the land bank, succeed.

29. It is recommended that the Government sell its land at \$5 an acre, on terms, prepare and seed one-half the farm at a cost of about \$1,000, to be repaid by a deposit of 40 per cent on purchase and balance in 20 years at 4½ or 5 per cent. Under this plan many would succeed who would otherwise fail.

30. Settlers should be selected in accordance with their experience, capital, and other desirable characteristics.

31. The new land will require from 1,400 to 1,600 settlers to fully utilize it. Unless a definite plan of settlement is made, it will take many years to obtain them.

32. The pump districts are organized as districts or corporations. Due to indebtedness, it will probably require three irrigation district organizations to contract for the payment of the project.

33. If settlement proceeds rapidly, the project will probably yield about \$45 an acre on first-class land and \$35 an acre on second-class land. Hence it would take about 70 years to pay out after payments began, or 75 years from first public notice.

34. The committee concludes that, on the basis of the above conclusions and the passage of the proposed reclamation bill, the project is feasible.

W. L. POWERS,  
Soil Technologist.  
A. T. STRAHORN,  
Soil Surveyor.  
M. R. LEWIS,  
Agricultural Engineer.  
G. R. MCDOLE,  
Soil Technologist.

### LOCAL INDORSEMENT

ONTARIO, OREG.,  
September 30, 1924.

MR. GEO. C. KREUTZER,  
Director of Farm Economics,  
Bureau of Reclamation,  
Wilda Building, Denver, Colo.

DEAR MR. KREUTZER:

Answering your letter of September 19, we, the local committee, appointed to review the report of the experts on the Owyhee project, submit the following as a brief report on the questions outlined in your letter. This report will be followed by a larger and more comprehensive report at a later date.

1. In the brief time allotted to us it has been practically impossible to obtain authentic prices on raw lands in the Owyhee district. There are a great number of tracts of patented land as well as a number of tracts which have been recently entered upon. From those who own lands under the Owyhee project we have estimated that present prices range from \$15 to \$40 per acre, depending upon the location, topography, and quality of the various tracts. The real value of raw land for colonization purposes is a question upon which a great many people differ. There is, on one hand, the enthusiast who believes that this is the best land that lies out of doors and that it has practically no limit on value. On the other hand, there are those who believe that raw land has little or no value and that the water makes it valuable.



There are two road land companies which own rather large tracts of land within the boundaries of the district. One company owns about 10,000 acres and the other between 2,000 and 3,000 acres. Local agents for these companies are not advised at present as to the prices their companies have on this land. The companies have a tentative plan outlined for the colonization of their land lying within the boundaries of the Owyhee project. As we understand it, the plan contemplates a very small down payment, probably not to exceed 10 per cent, with the remainder of the purchase price spread over a period of 30 or 35 years, the remainder of the purchase price to be amortized on a plan somewhat similar to the plan under which the Federal land bank loans are made. As we understand it, the tentative plan of the road land companies contemplates an interest charge of about 5 per cent on the deferred payments with an amortization payment of 1 or 2 per cent per annum. Under this plan the raw lands would make an attractive investment at a much higher price than if the settler was compelled to pay cash for the raw land. Private individuals, however, will probably not be able to extend such favorable terms to the settlers and will perhaps have to take a less price per acre for their land.

It seems to this committee that the cost of preparing the land, its location, and its fertility should have some bearing on its value, and that (as in the case of the farm unit) there should be a sliding scale of valuation adopted and an appraisal of each tract made. This valuation would probably range from \$2.50 to \$25 per acre. All of those whom we interviewed seemed quite willing to accept a valuation on the raw land which may be set by a board of appraisers properly selected to go over the lands of the project and make a careful appraisal of the same.

This committee feels that in order to prevent speculation the report of the Fact Finding Commission should be adopted and enacted into law.

2. The best type of agriculture for this section, in the opinion of this committee, is the production of hay, forage, and grain crops, which would be fed principally to dairy cattle, beef, sheep, hogs, and poultry. There is a large area of this county tributary to the Owyhee project which will never be anything but grazing land. Normally, Malheur County supports around 300,000 head of sheep and a large number of cattle and horses. There will always be a certain amount of hay and grain crops which will be cash crops, salable to the range herds which winter in

the valley along the Snake River. The rest of the forage and grain crops must be fed to livestock on the farms. We feel that a certain portion of each farm unit should be planted to alfalfa or clover and a certain portion to pasture and grain, so as to provide feed for the range herds and feed for the finished livestock and dairy herds that would be kept on the farms. The remainder of each unit should be planted to crops which we may speak of as cash crops or speculative crops, such as fruit, lettuce, clover seed, onions, alfalfa seed, celery, beans, broom corn, tomatoes, and potatoes. The older settled land under the Owyhee project has adjusted itself to this type of agriculture in about the following proportions: Three acres of hay and forage crops to one acre of the cash or speculative crops. We feel that this is about the proportion proper for this section as it has worked out satisfactorily under the present ditches.

In fixing the size of the farm units consideration should be given to the fertility of the soil, topography of the land, its location, as well as the particular characteristics of the individual settler. While in some localities or individualities one man would successfully take care of 100 acres, another man, under different conditions, could not successfully handle to exceed 20 acres. We do not feel that the farm unit should be fixed arbitrarily but should be based upon a sliding scale and should range from 20 acres up to 100 acres.

3. It is a well-known fact that all of the cheap reclamation projects have been built. Consequently we must have some changes in the reclamation laws in order to successfully and quickly colonize new projects. The recommendation of the Fact Finding Commission that repayments to the Government on construction charges be made at the rate of 5 per cent on the gross production per annum is a change in the reclamation law that we feel should be made. In addition to this we feel that a fund should be established whereby each settler could be loaned a sufficient sum of money on rather long-time terms to assist him in the development of his land. We would suggest that such loans provide funds for assisting in leveling, ditching, fencing, first seeding, pure water, and all buildings that are attached to the land. We believe that short-time loans should be handled by a local organization. The short-time loans would include funds for the buying of livestock, such as hogs, dairy cattle, sheep, and equipment. We do not wish to be understood, however, to recommend that all this be given to the settler. We feel that he should have a certain part of

his necessary capital so as to insure his interest in the success of his venture. Under ordinary circumstances we feel that the settler should have of his own funds at least 50 per cent of the amount he will require on short-time loans and 25 per cent of the amount he might require on the long-time loans. He should not be required to have as large a proportion of the amount needed for permanent improvements as he should be required to have of the amount needed for livestock and equipment, for the reason that the amount invested in permanent improvements would be a capital investment and would be gradually increased.

Any such loans which might be made to the settlers by the Government should have careful supervision by the project manager or some one who would keep in close personal contact with each settler. The safety of the Government's investment in the project should always be one of the first considerations and the settlers should not be allowed to get the idea that the Government owed them something or was making them a gift.

If no plan is provided under the new reclamation law whereby the settlers can obtain loans to assist in the development of their lands, the average settler on the Owyhee project should have from \$3,500 to \$4,000 in cash, livestock, or equipment.

We feel that settlers on the project should be carefully picked and selected with due regard to their experience, aptitude, and other characteristics which would tend to make them successful and desirable residents of the community.

We do not favor a wholesale plan of preparing and seeding a portion of each farm unit to alfalfa or clover for the following reasons:

First. After it is definitely decided by the Department of the Interior that the Owyhee project is to be built it will be several years before water will be available upon the new land. In the meantime people who have patented land or land upon which they have filed, or those who wish to buy land, can employ their time by getting their land prepared and ready for the water when it comes.

Second. Each man should have the option of either having the Government prepare a portion of the land for him or of doing it himself so that he may reap the benefit of his own labor, if he desires to do the work himself. We do, however, favor the creation of a small revolving fund which would be available to prepare a certain amount of land under the project so that if there is a prospective settler who wishes a portion of his land already seeded to alfalfa or clover, or who has his livestock and equipment at the time of

(Continued on page 6)

## OWYHEE PROJECT REPORT

(Continued from page 5)

purchase, he could then buy the prepared land and immediately have productive crops. Such a revolving fund could also be used to prepare and seed lands which we might term experimental farms to see what might be done with that particular type of soil or location.

In arriving at the average gross returns per acre under the project we have consulted with the county agriculturist and secured records from him as to the yields, prices, and percentages of the various crops. The accompanying table has been worked out from the statistics furnished the committee by Mr. L. R. Breithaupt, our county agriculturist.

This table is prepared from records extending over a period of 5 years and which include nearly 300 individual records. In many cases the same farm has reported over the full five years. These records disclose that oats is not a paying crop and consequently we have dropped it from our table. Prices are based on the 10-year period from 1909 to 1918, inclusive, and we might state that for practically all of the crops included in the table present prices are much better than those used in the table.

Assuming that the settlers repay the construction charge at the rate of 5 per cent of their gross annual return and that

the cost of the project will be \$139 per acre, it will take 55 years from the time payments start and 60 years from the first notice to return to the Government the full cost of the Owyhee project.

We feel that the Owyhee project is entirely feasible and thoroughly practicable. It is our opinion that the lands embraced within the project constitute one of the largest bodies of high-class land in the West that is susceptible of irrigation. Every condition for the success of the project is present. The Owyhee project has good soil, abundant water, an excellent climate, high-class citizenship, and a large portion of the land already settled and successfully farmed under a partial water right. There are 15 common schools, 4 high schools, and 7 progressive little cities and towns now on the land which will be embraced within the project. Three main State highways and one State market road bisect and cross the lands under the project. No part of the proposed project is more than 5 miles from a gravelled highway at the present time. A hydro-electric power line now runs through the length and breadth of the lands embraced in the project. Cooperative marketing agencies and a county agriculturist and a county club leader now serve those living within the boundaries of the district.

A main line transcontinental railroad runs through the length of the project and two branch lines of the railroad serve other portions of it. No part of the project is more than 8 miles from a railroad station or a loading point. We now have excellent prospects of securing a direct rail connection with San Francisco and Los Angeles, Calif., markets. Due to the rapid growth of those centers, they furnish an excellent market for many of the products raised in this section for the reason that the products grown here are not successfully raised in California.

We feel that if the recommendations of the Fact Finding Commission are enacted into law and the Owyhee project constructed, it will be an outstanding success and a creditable monument to the Reclamation Service and to the foresight and wisdom of those who prepared the fact finding report.

Respectfully submitted,

IVAN E. OAKES, *Chairman.*

DICK TENSEN,

HARRY B. COCKRUM,

*Local committee, Owyhee project.*

The health and comfort of stock, their individual likes and temperaments, and many other things seemingly small count for a great deal in successful feeding.



Pure-bred dairy herds should be a feature of the Owyhee development

1	2	3	4	5	6
Crop	Reasonable average yield per acre	Reasonable average price expectation based on 1909-1918 statistics	Probable gross return per acre	Approximate present crop production in percentage of total farm area	Composite factor of columns 4 and 5
Alfalfa.....	5 tons.....	\$8.00	\$40.00	41	\$1,640
Wheat.....	40 bushels.....	1.00	40.00	12	480
Corn.....	60 bushels.....	.875	52.50	7	368
Ensilage.....	10 tons.....	5.50	55.00	3	165
Clover.....	1.5 tons hay.....	7.50	61.25	5	306
	5 bushels seed.....	10.00			625
Potatoes.....	125 hundredweight.....	1.00	125.00	5	625
Barley.....	55 bushels.....	.70	38.50	4	154
Fruit.....	1/2 carload.....		250.00	4	1,000
Pasture.....	2-3 cattle, 8-10 sheep.....		28.00	2	56
Vegetables.....	1/2 carload.....		150.00	1	150
Miscellaneous.....			40.00	1	40
Buildings.....				15	

Total, \$4,984

Gross, \$49.84.

## COTTON GROWING ON THE SOUTHWESTERN PROJECTS

*The article reflects the methods generally used on the Salt River, Yuma, Carlsbad, and Rio Grande irrigation projects, where the various operations to produce a crop are more or less the same*

FOUR of the irrigation projects of the Bureau of Reclamation had large acreages of cotton in 1924. The yields reported and the prices obtained indicate that this is one of the major crops of the southwestern country, when grown under irrigation, and offers satisfactory returns to farmers who understand the methods of successfully growing it. The Salt River and Yuma projects in Arizona, the Carlsbad project in New Mexico, and the Rio Grande project in New Mexico and Texas have revealed some interesting figures. In 1917 only 40,000 acres of cotton were grown on these projects, whereas in 1923 the area had increased to 135,627 acres which produced a crop with a gross value of \$16,745,231, or an average of \$123.46 an acre. This sum was more than one-quarter of the total of the 1923 gross crop value of these projects. The crops returns for 1924 were not yet completed at the time this article was written.

During the war long-staple cotton was much in demand and high prices were obtained until 1920 when the growers experienced great difficulties in disposing of their crop. Since that time they have turned their attention to growing medium-staple varieties although some long-staple cotton is still grown.

The two principal medium staple varieties grown are Acala and Durango, although Hartsville, Lone Star, and Mebane are grown to some extent. The tendency during the past two years has been to produce staples of  $1\frac{1}{8}$  inches to  $1\frac{1}{2}$  inches in length, notwithstanding a premium is paid for longer staple varieties. Some times the premium paid for the better staple cotton is as high as 2 cents per pound, or even more. The reasons that shorter staples are favored by the growers are that they mature earlier, produce a larger percentage of lint, are much easier picked, and always find ready sale at market prices. Picking and ginning are considerable items of expense and since these operations are paid for on a pound basis for cotton in the seed it can readily be seen that the higher the percentage of lint the more profitable is the crop.

A long growing season is required to produce cotton successfully. In addition to this, warm day and night temperatures are needed. Cotton has been grown in some sections which had a long growing season but where temperatures were moderate during the day and cool at night. The results were disappointing because a

sufficient number of the bolls did not come to maturity.

To produce satisfactory yields of cotton good cultural methods must be followed and special attention given to the preparation of the seed bed, moisture in the soil, good seed strains, clean cultivation, and maintaining soil fertility.

*Cotton should be grown in a systematic and well planned crop rotation and should not be on the same ground more than once in three years. A rotation which has proved highly satisfactory through long trial in Turkestan, an old cotton-producing country with soil and climatic conditions similar to those in the cotton-growing sections of Arizona, is as follows: (1) Cotton, two years; (2) corn, followed by a green manure crop such as cowpeas or tepary beans, one year; (3) barley, followed by a green manure crop, one year; (4) cotton, one year; and (5) alfalfa, three years. Most of the older agricultural countries have found it necessary to keep lands in soil-building crops approximately 50 per cent of the time. The foregoing rotation meets this provision and also contains the two leading crops for southern Arizona—namely, cotton and alfalfa.*

On land that has grown cotton the previous year the following practice is generally followed. The standing stalks are cut with a one-row stalk cutter as soon as they are dry and brittle after fall frosts. Since the land is dry, a winter irrigation is given before plowing. This irrigation permits deep plowing, from 6 to 8 inches in depth, and adds to the stored moisture in the soil. This saves on the amount of the summer irrigation needed to produce the crop and also puts off the time of the first irrigation, which experience has shown is desirable. The winter plowing is usually done in January.

Preparation of the land to receive the seed is done in the spring. This may include a second plowing but usually it does not. The plowed land is double harrowed, disced, or smoothed with a heavy drag. Some advocate a heavy irrigation at this time, which is best accomplished with a moderately cloddy surface. Others have found that an irrigation in which the amount of water used is equivalent to

covering the land 6 inches in depth is sufficient and can best be applied to a reasonably smooth surface. As soon as the land is dry enough to work, it is double disced and given as many harrowings with a drag harrow as are necessary to obtain a fine, well firmed seed bed, and then floated before planting. These extensive cultivations are threefold in their purpose—first to establish a desirable seed bed, second to eradicate foul weed growths, and third to conserve moisture.

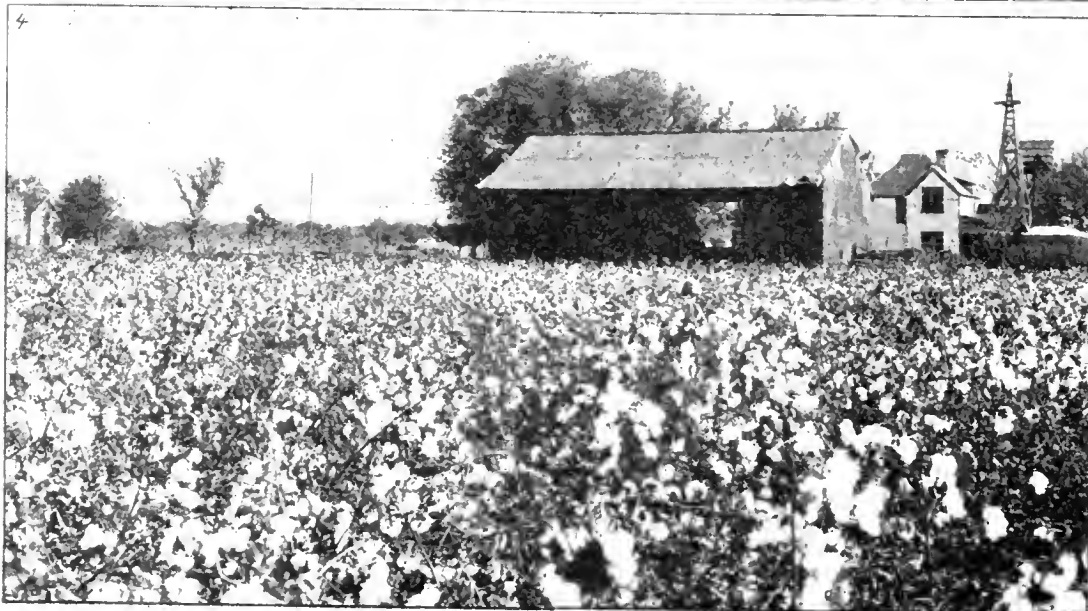
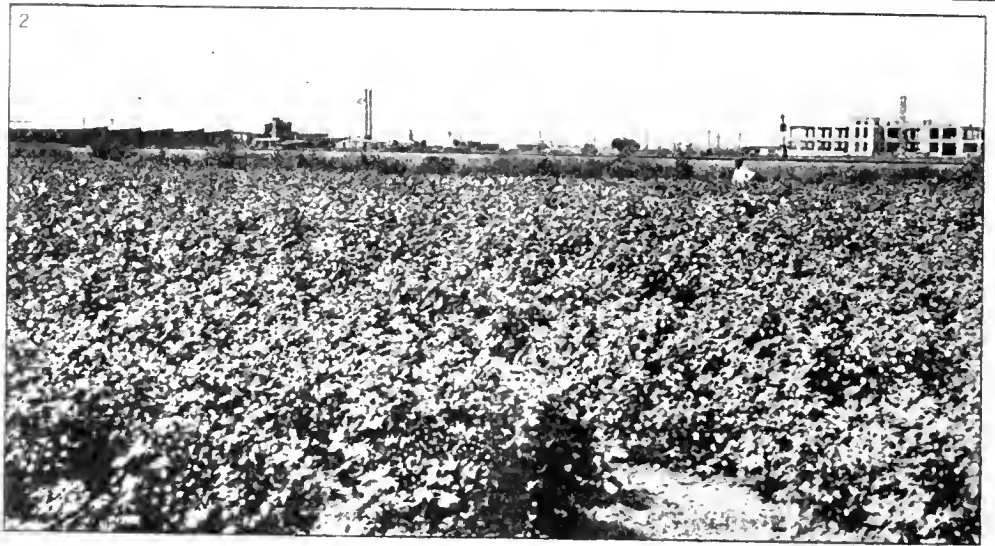
Many growers advocate the lapse of a few days, or even a week, before planting to allow the seed bed to become warm, but without allowing the soil to become unduly dry. Generally flat planting is considered best, using disc furrow openers set just deep enough to push aside the dry surface clods, which insures uniform depth of planting in moist soil. A few ridge their field before planting and then plant the seed in the ridges. The character of soil determines which system is preferable. The planting is done with an ordinary two-row cotton planter, with preference for the open wheel type. The seed is planted from  $1\frac{1}{2}$  to 2 inches deep in rows  $3\frac{1}{2}$  feet apart. From 25 to 30 pounds of seed are used per acre. One of the most common mistakes made by inexperienced growers is planting the seed too deep. On the Carlsbad project the average dates of planting are from the 10th to the 25th of April.

It is important that a uniform stand of plants be secured, as without this good yields of cotton can not be obtained. Good seed bed preparation and subsequent operations have much to do with it. After the seed is planted driving rains may cause a crust to form on the surface of the soil, which, if left undisturbed, will not permit the young plants to come through. This condition is relieved by an immediate light harrowing.

The above methods are common when cotton follows cotton, milo, maize, or other row crops. If an alfalfa field is to be prepared for cotton growing, it is best to plow the land shallow in early or mid summer with a sharp plow, which will cut off the crowns of the alfalfa plants, follow with a discing, and seed the land to hegira or milo maize. Subsequent cultivations destroy weeds, assist in eradicating the remaining alfalfa plants, and leave the land quite clean for cotton the following year.

Usually the first cultivation of cotton can be done with a harrow crosswise to

(Continued on page 9)



1, 4, and 5, a two-bale to the acre cotton crop on the Carlsbad project; 2, a cotton field near El Paso on the Rio Grande project; 3, cotton growing on Senator Winsor's ranch on the Yuma project



## COTTON ON SOUTHWESTERN PROJECTS

(Continued from page 7)

the rows. Subsequent cultivations should be frequent, stirring the soil to a depth of 3 or 4 inches and at intervals of a week to 10 days apart.

When the plants begin to show their third or fourth leaf, they are thinned. Practice varies somewhat in different localities. In some districts plants are left at intervals of 12 to 14 inches in the rows, whereas in other localities they are left from 6 to 10 inches apart. It is claimed that crowding the plants in the rows tends to force early blooming and maturity.

After thinning cultivation should be shallow and repeated often. The location and extension of root growth determine the proper depth of cultivation. On a light sandy soil it is said that the taproot of a cotton plant may penetrate to a depth of 3 feet; on heavy soils the taproot may not reach more than a depth of 1 foot and then direct its course more or less horizontally. Many of the lateral roots start from the plant near the surface and may not penetrate the soil to depths of more than 8 to 10 inches. These habits of root growth indicate the advisability of shallow cultivation.

The first irrigation after the plants are up should be delayed as long as possible without adversely affecting the vigor of the plants. This period varies from six weeks to two months. Generally water is applied by the furrow method, although some irrigate by the border system. It is better not to flood the plants if it can be avoided. From two to five irrigations are given to mature the crop. Frequency of irrigation is determined by the moisture conditions of the soil. The practice is to not allow plants to suffer or show signs of wilting after irrigation has once begun. If plants become too dry they shed young bolls and squares, thus reducing the possible crop. Cultivation should follow promptly after each irrigation.

Harvesting usually commences in October and the cotton is picked by hand and hauled to the gin. The picking is done largely by Mexican laborers. The price paid varies from \$1 to \$1.75 per 100 pounds, depending on the locality. The cost of ginning is \$7.50 a bale, which includes bagging and ties. Harvesting is often not completed until January. The long dry period at picking time and the late arrival of frost in the Southwest permit going over the fields several times. Late blossoming fruit is therefore saved.

The current prices so far obtained in 1924 have been from 23 to 26 cents per pound for the average lists of cotton sold. Cottonseed has been selling at \$16 to \$22 per ton and is purchased by cotton-oil mills. Several cotton-oil mills are under construction on or near the projects, which are being largely financed by the growers, and better prices are anticipated for cottonseed in the future.

A bale of lint cotton weighs approximately 500 pounds and a yield of one bale per acre is considered very profitable and satisfactory. Maximum yields of 1½ to 2 bales per acre are being obtained under most favorable conditions. The average yield of cotton on the Carlsbad project is estimated to be two-thirds bale per acre, or a gross yield of 14,000 bales for the project.

The cost of growing is, of course, variable but is approximately \$45 an acre, based on a one-half-bale crop. This cost would include picking and water charges.

There are 25 gins located on the Rio Grande project and the other projects are equally well served.

Buyers representing the various cotton firms are always on hand on the different projects and competition is keen for the better grades of lint, which no doubt accounts for the prices obtained approximating those received at New Orleans and New York.

The cotton fields on the projects have been fortunate in not being affected by serious insect pests or plant diseases. In other sections of the country the cotton-boll weevil is responsible for large crop losses, but apparently it does not thrive in a dry climate. Slight losses have occurred in restricted areas on the projects by the cotton bollworm, but it has been held in close check by cultural methods and spraying.

The future for cotton production on these projects appears to be very promising, especially if soil fertility can be maintained. A proper crop rotation should be followed on each farm, in which alfalfa, fed to livestock, should find a prominent place. Hope lies also in careful seed selection, already recognized and practiced by many growers. The adoption of one variety of cotton for a locality is desirable, when possible; it would permit standardization of quality and prevent cross-pollination as well as develop a market for a certain length of staple.

## BRITISH COLONISTS FOR CANADIAN LAND

At the request of Commissioner Mead, Hon. F. C. Blair, acting deputy minister of immigration and colonization, Ottawa, Canada, has furnished the following statement concerning the arrangements recently completed by the British and Canadian authorities for the settlement on Canadian land of 3,000 British agricultural families:

The details, in connection with this scheme, were arranged with the Imperial Government by the minister of immigration and colonization during a recent visit to Great Britain. The Imperial authorities have agreed to advance \$4,500,000 to assist British agriculturists to come to Canada and engage in farming. None but bona fide farmers, who intend to continue their occupation in Canada, will be eligible for a loan, and, while no specific amount is allowed in each case, the loans will be fixed according to the immediate needs of each family. These loans will be repayable over a period of 25 years. The Dominion Government assumes no financial responsibility whatever in the matter. The families will be placed on land already owned by the Canadian Government, and this department will not only have the right of selection but also the placing of the families on arrival. The necessary staff to carry on the work of selection will shortly proceed to Great Britain and it is expected that in the early spring a considerable number of British agricultural families will be coming forward and settled throughout the various Provinces.

## EMPLOYEES OF BUREAU DURING PAST 11 YEARS

The accompanying statement shows the fluctuations in the number of employees of the Bureau of Reclamation, including laborers, during the past 11 years, as of the month of June:

1924 (exclusive of Salt River).....	4,476
1923 (exclusive of Salt River).....	4,740
1922 (exclusive of Salt River).....	3,667
1921 (exclusive of Salt River).....	4,507
1920 (exclusive of Salt River).....	3,783
1919 (exclusive of Salt River).....	3,819
1918 (exclusive of Salt River).....	3,288
1917.....	6,483
1916.....	5,410
1915.....	8,373
1914.....	8,170

The old pioneer settlement with its primitive farming is impossible under present conditions.

## IRRIGATION HINTS FROM A PRACTICAL IRRIGATOR

*I. D. O'Donnell, formerly connected with the Bureau of Reclamation and one of the foremost practical authorities on irrigation methods, tells the Montana Irrigation and Drainage Institute how to get results*

WE are taking it for granted that the farm we are now about to begin irrigation on has the water delivered to the highest point.

The first important point to consider is the system to install or the plan of irrigation best adapted to the locality or to the lay of the land and also to the style of farming contemplated. Thus far in Montana the general system that has been adopted is what is called the lateral or flooding system, with the furrow system where applicable, as in orchards or crops such as potatoes, corn, sugar beets, and others where cultivation is necessary. The lateral system is by far the most economical, cheapest, and best adapted to the beginner in irrigation, in that it does not require any intensive system of leveling and grading. The water is led around by gravity and on contours to the high points and then let flood over the intervening spaces. The permanent laterals lead along the headlines of the farm, then the main distributing laterals to all the high points in the fields following lines of

least resistance. Some of these may require levees through the low places and occasionally cuts through some of the highest points. In some places it might even be cheaper to make flumes over the low places, but if possible the fill will be much cheaper in the long run.

After once found to be in the right place these laterals should be left for good, and the fills and banks sown with Dutch clover, brome, or some good grass that will hold the soil, provide permanent pasture, and prevent the seeding and growing of weeds.

*Field laterals.*—The balance of the lateral system, by which I mean the temporary laterals, will be made as you seed the farm. These will or should conform to the crops seeded and to the lay of the land. If your farm is fairly level with reasonable slope for irrigation, then nice straight ditches should be made close enough together so that the water will spread between. If the land slopes two ways then the ditches can be run on the bias and good results obtained. In aver-

age Montana soil these ditches should not be more than 50 feet apart. If your land is rolling then the laterals will be made on the contours so as to flood down the slope to the next lateral. In alfalfa and like crops where the land is plowed each season it is better to plow these laterals in. We find that filling in and making new each year avoids a great many weeds and pests. We also find that these ditch spaces are very highly fertilized with silt and so should be moved over each year to gain the full advantage of such conditions.

*Size of laterals.*—Now that we have the general idea of the land in our mind we will go back over the work to see just what is most important. First, it is a good idea to make all these systems good and at least double capacity. Like a great railroad bridge, plan for the heaviest load, then add another 100 per cent in case of emergency. In all systems there are times when a farmer can get an extra supply of water if he is only ready to grab

(Continued on page 11)



Looking down one of the laterals on the Orland project, with almond orchard in the background

## PLANS FOR PROJECT REAPPRAISALS

**F**ORMER Gov. Thomas E. Campbell, of Arizona, and Dr. John A. Widdtsoe, of Utah, will be chairman of two committees to survey Federal reclamation projects and carry out the reappraisal provisions of the new reclamation law contained in the recent deficiency act, it has been announced by Secretary Work.

Plans being consummated by the Bureau of Reclamation provide for an investigation of 21 of the 25 Government reclamation projects. Two separate committees will be organized, each committee to have charge of surveying one-half of the projects. Governor Campbell, who is to head one of them, was chairman of the Fact Finding Committee on Reclamation and Doctor Widdtsoe, who will head the other, served as secretary of the Fact Finding Committee.

The surveys will ascertain the facts on each project where, on account of lack of

fertility in the soil, an inadequate water supply, or other physical causes, the settlers are unable to pay construction costs. They will also investigate whether the cost is being charged upon a smaller area of land than the total area of land on the projects. The results of these surveys will be reported to Congress by the Secretary of the Interior in accordance with the provisions of the new reclamation law.

Although the organization plans of the two committees have not been completed, it is certain that one representative from each State, to be appointed by the governor, will act in investigating the projects located within his particular State. The Acting Chief Engineer and the Director of Reclamation Economics of the Reclamation Bureau will, where desired, act in an advisory capacity to the com-

mittees. Additional members have not been decided upon.

The projects to be surveyed for the purpose of ascertaining lack of fertility in the soil, inadequate water supply, or other physical causes responsible for the inability of water users to make their construction payments, including charges on too small an area of land include: Yuma, Arizona-California; Orland, California; Grand Valley and Uncompahgre, Colorado; Boise, King Hill, and Minidoka, Idaho; Huntley, Milk River, and Sun River, Montana; Lower Yellowstone, Montana-North Dakota; North Platte, Nebraska-Wyoming; Newlands, Nevada; Carlsbad, New Mexico; Rio Grande, New Mexico-Texas; Umatilla, Oregon; Klamath, Oregon-California; Belle Fourche, South Dakota; Strawberry Valley, Utah; Okanogan and Yakima, Washington; Shoshone, Wyoming.

The surveys are to be conducted during the coming spring and summer and are expected to be completed in time to report the facts to Congress at its regular session in December, 1925.

## PRACTICAL IRRIGATION HINTS

(Continued from page 10)

it. So by all means be prepared for extra water if it should come. The extra work and space taken for it are small compared to the advantage it may be to you.

**Plenty of field laterals.**—The next thing down the line is that in all field laterals do not be afraid to plow up a little land. The great conservator in both labor and water is plenty of laterals. Short runs, both in furrow and field, speak successful irrigation. Fifty-foot spread and 400-foot or less run are better than 100-foot spread and 800-foot run. Make all your field systems right after seeding. Do not wait with the idea that you might not have to irrigate. That speaks failure right off the bat. With the ditches made early, the dirt will settle, the crops grow up through the banks, and they will hold water much better and be far less trouble. That old motto, "Better be ready and not go than to go and not be ready," applies well to this case.

**Better farming.**—At this point I think is the time to say a word for better farming, as it is here that irrigation plays its part for good or for bad. The better the farming the less irrigation required. Good thorough cultivation with a reasonable amount of fertilization will save one irrigation on the average crop that is usually irrigated twice. In other words, fertile soils require less water than poor soils, or at least retain moisture better. A good top dressing of manure on alfalfa will eliminate one irrigation. Fall plow-

ing will usually do the same. In fact, one secret of irrigation is to avoid it whenever possible. Cultivation before and after irrigation should be your motto.

**Amount of water.**—On most of Montana soils, good irrigation is putting the water on and off again reasonably quickly, except in the cases of some furrow irrigation such as potatoes, where it is necessary at times to let the water work through. In a great many of our lighter soils, 6 acre-inches is about as light as we can put it on in an irrigation, and this is far more than is needed.

The average farmer irrigates just a little too soon, and usually once too late. Most of the small grains do not need irrigation after it passes out of the boot or early head. Six inches of water will pass on through the average soil and some of it be wasted. In some of the better and older systems they are able to put on, by use of large heads, 2 or 3 inches of water in one irrigation. We should study the results of nature's work. For instance, on dry land with good farming, with 6 to 9 inches of rainfall in the growing season, they can raise 40 bushels of wheat.

**Tools and equipment.**—There are a great many ditchers on the market, but any farmer can make homemade tools that will answer all purposes. The first is a land level for finishing off all fields before seeding. Pulled across the field it will fill all dead furrows and will level back furrows and fill all voids. This machine will

also do considerable general smoothing and clod crushing. Next we need a ditcher of some kind. A common 18-inch lister or double plow makes a very good lateral. One or two furrows with a common plow and then a trip through with a go-devil or a log will do the work. On my own farm I have a ditcher made from two right and left 14-inch walking plows bolted together, pulled by four horses. There is also a homemade rig for making dams, called a dammer, that is useful at times. There are various kinds of dams—metal, canvas, and wood. Each is very good in its place. The farmer should decide which is best suited for use on his own farm. Another plan which I have found very good is to make a number of dams, especially in grains, when you make the ditches. This prevents loss of water and time in the rush hours of irrigation. A good point, not always remembered, is to place your dams in the high places. Avoid the low spots. They will take care of themselves when it comes to getting their share of the water.

Keep the laterals clean. A clean lateral means water saved, and on an irrigated farm water saved means cash saved. Main laterals should be cleaned at least twice a year. Last but not least, get a good honest man who will use his head as well as his hands, and give him a good shovel. The shovel I like should not be too heavy, fairly straight, with small shank and sharpened daily or oftener. Tell your man not to try to dig up the whole farm, but just to get in front of the on-coming water and keep it blocked.

## A SUCCESSFUL GRAPEFRUIT GROVE ON THE YUMA MESA

*The possibilities of the Yuma Mesa as a producing area for grapefruit are shown in this article, which describes the results obtained by Mr. George Hill and outlines future plans.*

GEORGE C. KREUTZER, Director of Farm Economics of the Bureau of Reclamation, recently visited the Yuma project and in the course of his trip over the project inspected one of the developed grapefruit groves on the Mesa which he describes as follows:

The Yuma Mesa is a tract of table-land lying above the plane of the Yuma Valley. The soil is sandy in character and is suited to the production of semi-tropical fruits and vegetables. The Yuma Valley affords excellent air drainage, which accounts for the long frost-free period.

There are 45,000 acres in the Mesa, but only 3,000 acres are ditched and piped. Only 400 acres of this area are planted to fruit.

Mr. George Hill, a skilled citriculturist who had rejuvenated two groves in southern California, came to Yuma nine years ago and started the development of a 10-acre grapefruit grove on the Yuma Mesa. He carefully leveled the land, installed pipe lines and valves, and planted the area to selected grapefruit stock, planting the trees 24 feet apart. After allowing for roads, 800 trees were set out on the 10 acres.

There is nothing cheap about developing one of these orchards. The figures

given by Mr. Hill show that it costs about \$600 an acre the first year exclusive of the cost of land and water right, and from \$160 to \$225 an acre each succeeding year. Some crop will be borne the fourth year, and approximately four boxes per tree the fifth year, which, credited to the expenses, leaves a net investment of \$1,000 an acre, or \$10,000 for a 10-acre grove including land and water right. This is from \$500 to \$1,000 less than in proven sections elsewhere.

On November 5, 1924, this grove was visited just as the fruit was ripening, and the yield was approximately six to eight boxes, of 50 pounds each, to the tree. Mr. Hill stated that the entire crop had been sold at 5 cents a pound orchard run. This high price was being obtained because of the excellent quality of the fruit, which was of uniform size, typical shape, and of fine texture and flavor. The sturdiness and vigor of the trees are remarkable, owing to proper fertilization and irrigation methods. Each year 20 to 30 tons of barnyard manure are applied to each acre, supplemented by superphosphate and other commercial fertilizers. These fertilizers are plowed into the orchard in furrows located at the extreme limits of tree growth, commonly called at the point of "drip," so named be-

cause of rain running off the leaves to the ground surface.

To each tree is attached a card upon which are recorded the yield and grade of fruit grown. These records are kept yearly and serve the same purpose as cow-testing records do for the modern dairyman. Trees producing poor quality or poor yields are top worked by using buds from trees of known high production.

Cover crops of purple vetch and hubam clover are grown in the winter and plowed under in the spring, which adds humus and consequent fertilizers to the soil.

This grove demonstrates that the Mesa will become one of the large producing areas of grapefruit in the southwest. It also demonstrates the value of planting nursery stock of known quality and following with proper methods of fertilization, irrigation, and cultivation to produce high quality and yield.

Mr. Hill is also developing 200 acres of similar land on the Mesa for a syndicate in which members own from 5 to 10 acres. Each member owns a definite plot of land, but the cost of irrigation, fertilizing, cultivation, and care is pooled and paid for on an acre basis. The syndicate grove shows the same vigor and care in cultivation as are shown on Mr. Hill's

(Continued on page 13)



A grapefruit grove on Colonel Fly's "beloved Yuma Mesa"



## FIELD ORGANIZATION CHANGES

THE Secretary of the Interior has promulgated the following orders relating to changes in organization and titles in the Denver and field offices of the Bureau of Reclamation, effective January 1, 1925:

DECEMBER 4, 1924.

### ORDER

So much of the order of April 9, 1924, as relates to changes in titles in the Bureau of Reclamation is hereby amended effective January 1, 1925, as follows: "Project Managers are designated 'Superintendents of Ditches'" to "Superintendents of Ditches are designated 'Superintendents,'" with the same duties as defined in the above-mentioned order.

HUBERT WORK,  
Secretary.

DECEMBER 9, 1924.

### ORDER

Effective January 1, 1925, there is hereby established in the Bureau of Reclamation a Division of Reclamation Economics to be in charge of a Director of Reclamation Economics (now Mr. George C. Kreutzer).

Under the supervision of the Commissioner of the Bureau of Reclamation, the Director of Reclamation Economics, with headquarters at a point designated by law or by the Secretary of the Interior (now Denver) shall have charge of the investigation of economic problems connected with the development of existing or proposed reclamation projects, including the classification and settlement of land and the improvement of the industrial, agricultural, and social conditions of settlers. He shall also have charge of the activities of the bureau looking to cooperation with agencies designed to promote improvements in agriculture and in cooperative organization of communities.

All previous orders are amended accordingly including order and organization chart of April 9, 1924, which refer to the Director of Farm Economics, which office is hereby abolished January 1, 1925.

HUBERT WORK,  
Secretary.

DECEMBER 9, 1924.

### ORDER

Effective January 1, 1925, the following changes are ordered in the organiza-

## ROUTE YOUR LETTERS THROUGH THE PROJECT

*With a view to the efficient handling of the largely increased work of the Bureau of Reclamation resulting from the new reclamation legislation, it is suggested that water users, instead of writing direct to the Commissioner concerning their problems, route their letters through the Superintendents or District Counsel. The accompanying orders of the Secretary centralize authority on the projects in the Superintendents. They and the District Counsel know the local problems and view them sympathetically. Sending letters to the Commissioner through them will save time in referring many such letters back to the project for report because of lack of full knowledge of the case in the Washington office.*

tion of the Bureau of Reclamation, Department of the Interior:

**Chief Engineer.**—Under the supervision of the Commissioner, the Chief Engineer, with office at a point designated by the Secretary of the Interior (now Denver), shall have charge of all matters relating to engineering investigation, construction, operation, and maintenance of the projects and of all employees of the Denver offices, with the exception of the Director of Reclamation Economics and his force, and of the legal staff maintained at that point. The Chief Engineer shall report to the Commissioner.

**Director of Reclamation Economics.**—Under the supervision of the Commissioner of the Bureau of Reclamation, the Director of Reclamation Economics, with headquarters at a point designated by law or by the Secretary of the Interior (now Denver) shall have charge of the investigation of economic problems connected with the development of existing or proposed reclamation projects, including the classification and settlement of land and the improvement of the industrial, agricultural, and social conditions of settlers. He shall also have charge of the activities of the bureau looking to cooperation with agencies designed to promote improvements in agriculture and in cooperative organization of communities. The Director of Reclamation Economics shall report to the Commissioner.

**Superintendents.**—Under the supervision of the Commissioner and the Chief Engineer, Superintendents, with offices designated by the Commissioner, shall have charge of all employees with the exception of the District Counsel and their force, and of all work connected with the construction and operation of their respective projects, including the execution of all contracts which under present regulations are executed on the projects. Superintendents shall report to the Chief Engineer.

**Denver Office Manager.**—The office of Office Manager is abolished and the title of the incumbent changed to Chief Clerk, who will perform the usual duties of that position. The Chief Clerk shall report to the Chief Engineer.

The general effect of the above changes is to centralize authority on the projects in the Superintendent, and in the Denver office in the Chief Engineer.

All previous orders are amended accordingly.

HUBERT WORK,  
Secretary of the Interior.

## YUMA MESA GRAPEFRUIT GROVE

(Continued from page 12)

grove. The trees on the 200 acres are one and two years old, and the stand is remarkable, less than 1 per cent failing to start. It is an example of what skill and experience can accomplish in a highly technical industry.

The chamber of commerce, presidents of banks, and other influential citizens are planning the organization of a large corporation, financed locally, to develop such areas extensively on a cost plus basis with the idea of bringing a large area of small individual farms to the bearing stage, in an effort to make the Mesa a producing area to develop their community. With

that ideal in view the development should succeed. There is a field for this activity, as this work might better be done for the average settler at cost plus than to allow him to shift for himself.

The Mesa should prove a highly desirable grapefruit section offering good returns for the money invested, but the success of a developing corporation will depend entirely upon the service rendered. If the first group of settlers is given real service in which profit is not the main feature, the corporation should prosper and find applicants readily.

## AUSTRALIA'S DAWSON VALLEY IRRIGATION PROJECT

*The reservoir will supply water for 200,000 acres of first-class agricultural land and 2,000,000 acres of pastoral or stock land, all of which is at present unused.*

A BRIEF statement concerning the official opening of the first section of the Dawson Valley irrigation project was printed in the October issue of the NEW RECLAMATION ERA. At the request of Commissioner Mead, Mr. A. F. Patridge, of the Irrigation and Water Supply Commission of Queensland, Australia, has furnished the following additional information:

Queensland's irrigation project in the Dawson River valley is unique in the world's age-old history of this branch of engineering and agriculture, when construction quantities are considered in relation to storage. The latter will total 2,500,000 acre feet, and equals that of the Elephant Butte reservoir on the Rio Grande project. The material used in the construction of this dam was 600,000 cubic yards, whereas only approximately 110,000 cubic yards will build the Nathan Dam in Queensland, and a slight addition to this content would materially increase the storage if so desired. The plan comprises—

1. A reservoir on the Dawson River, about 180 miles inland, with a catchment of 9,000 square miles and an average rainfall over this area of 27 inches.

2. An overtake dam, 27 miles down, for the diversion of water from the river into a main canal flowing through the irrigable lands.

3. The irrigation by gravity of so large a proportion of the fertile river flats scrub lands commanded as will be determined by the quantity of water available, and the behavior of the reservoir. It was estimated in a previous statement that the reservoir would supply water for 200,000 acres of first-class agricultural land and 2,000,000 acres of pastoral or stock land.

The storage dam will rise 130 feet above the summer level of the Dawson River, and will have a crest length of 860 feet. The cost will be more than \$10,000,000. The overtake weir will raise water 21 feet above the present summer water level.

Work is in progress for the irrigation of 5,000 acres from above storage prior to commencing the large reservoir works. Only the top levels of the stored water could be drawn off by gravity, so it will be passed down the river 24 miles to Castle Creek and lifted by pumps to the river bank. It will then irrigate the 5,000 acres by gravity, and the canal system put in for this purpose will be

incorporated later with the main plan. Settlement can thus be started before the large works are put in hand, and gradually extended from this center as stored water becomes available. For the guidance of settlers and determining the best marketable products, the first work has been the establishment of an experimental farm at Castle Creek, where 150 acres have been cleared, fenced, partly plowed, and divided into plots. By the end of 1924 it was anticipated that the pumps would be working and planting well forward.

The irrigable lands are all the property of the Crown, though at present used for grazing purposes under various forms of leasehold tenure. The soils are of various colors and mechanical constituents, but all are shown by chemical analysis to be good agricultural land with open texture and good capillarity, suitable for irrigation and capable of growing any crop. In addition, humus is good and soils contain liberal amounts of all mineral plant foods in readily available form.

The preliminary 5,000 acres at Castle Creek can probably be filled with farmers from Queensland and other States without seeking settlers from abroad. Before being allotted farms full particulars of their experience and finances will be recorded and their suitability or otherwise determined. It is recognized that advances will be needed, which will probably be set at a maximum of \$2,000 to include house, implements, stock, and improvements. Where no improvements exist, as in the case of a newly selected farm, advances will be made gradually as the block is improved, and the settler's capability established. It is recognized, however, that the man who accepts State assistance only as a last resort is likely to prove the most desirable.

The amount of capital needed to take up a farm depends upon the area desired, and the experience, industry, and capability of the settler. A man with experience of Australian agriculture, in a position to do his own work, should manage on a capital of \$2,000. The building of expensive houses will not be countenanced, as the money can be put to better use in the land or in stock. Improved housing can come later. Men without money and without experience will be treated as undesirable, and spoon-feeding of the settlers will not be entertained. Judicious financial assistance is chiefly contemplated as an inducement to settlement where families have ex-

perience, are capable and willing to work, but are not financially strong enough without assistance. Pending a definite policy the extent of such assistance will not be bound by hard and fast rules.

After the farms are settled the next question is the profitable disposal of the produce. No dictation is proposed regarding the class of crop to be grown, nor how to dispose of it. The officers of the commission, if desired, will advise on this subject. Unity of action with his fellows will be to the advantage of each farmer, and by this means cooperative effort will be evolved, and the administration will work with this ultimate end in view.

To insure cheapness of production and handling, also economy in irrigating, it will be an advantage to set apart areas for certain products for specializing in them. Some crops need irrigation more frequently than others, and at different periods from others, and it is more economical to deal with compact sections of similar crops than scattered farms with varying products. For instance, a 1,000-acre section might be suitable for tobacco, so that drying kilns and treatment plant would be best suited in that area. Dairying and pig raising would require butter and cheese factories and bacon-curing plants.

A modern garden township has been laid out in the center of the area, situated on the banks of the Dawson River. The commissioner's office staff cottages have already been erected, and business sites will shortly be made available. A temporary sawmill was one of the earliest undertakings, and the permanent mill is now nearing completion. Blue gum logs available on the area provide excellent hardwood, and this mill should prove a factor later in reducing the cost of settler's cottages. The designs so far have been prepared with a view to reasonable comfort at a moderate cost, and plenty of veranda space has been provided.

The disposal of the produce grown in such a large area is an important question. The production of fresh fruits in this State has often exceeded the demand. This has not been due to overproduction, but to underconsumption, because the retail price to the consumer is too high for any but the well-to-do. When both apple growing in Tasmania and dairying in Australia increased by leaps and bounds, the bogey of overproduction was raised, but both are stabilized and capable of further expansion.

## SUCCESSFUL FARMING COMMUNITIES

IN the issue of "The New Palestine" of March 7, 1924, Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, tells what is being done by the Jewish Colonization Association and the Zionist Organization in the agricultural restoration of Palestine along well-planned, scientific lines. Doctor Mead points out that "the rural colonization of Palestine is now past its pioneer period. It needs to be organized for the larger expenditures involved in the complete occupation and development of the valleys, leaving the mountains for later attention. These things need attention: Money and plans for financing land buying, working out coordination plans for irrigation and drainage, first to protect health, next to create the best type of agriculture, and finally the determination of the size of farms, which will create small homes for the small farm laborer, and larger homes for the man who has help in his family or ability to direct work of others."

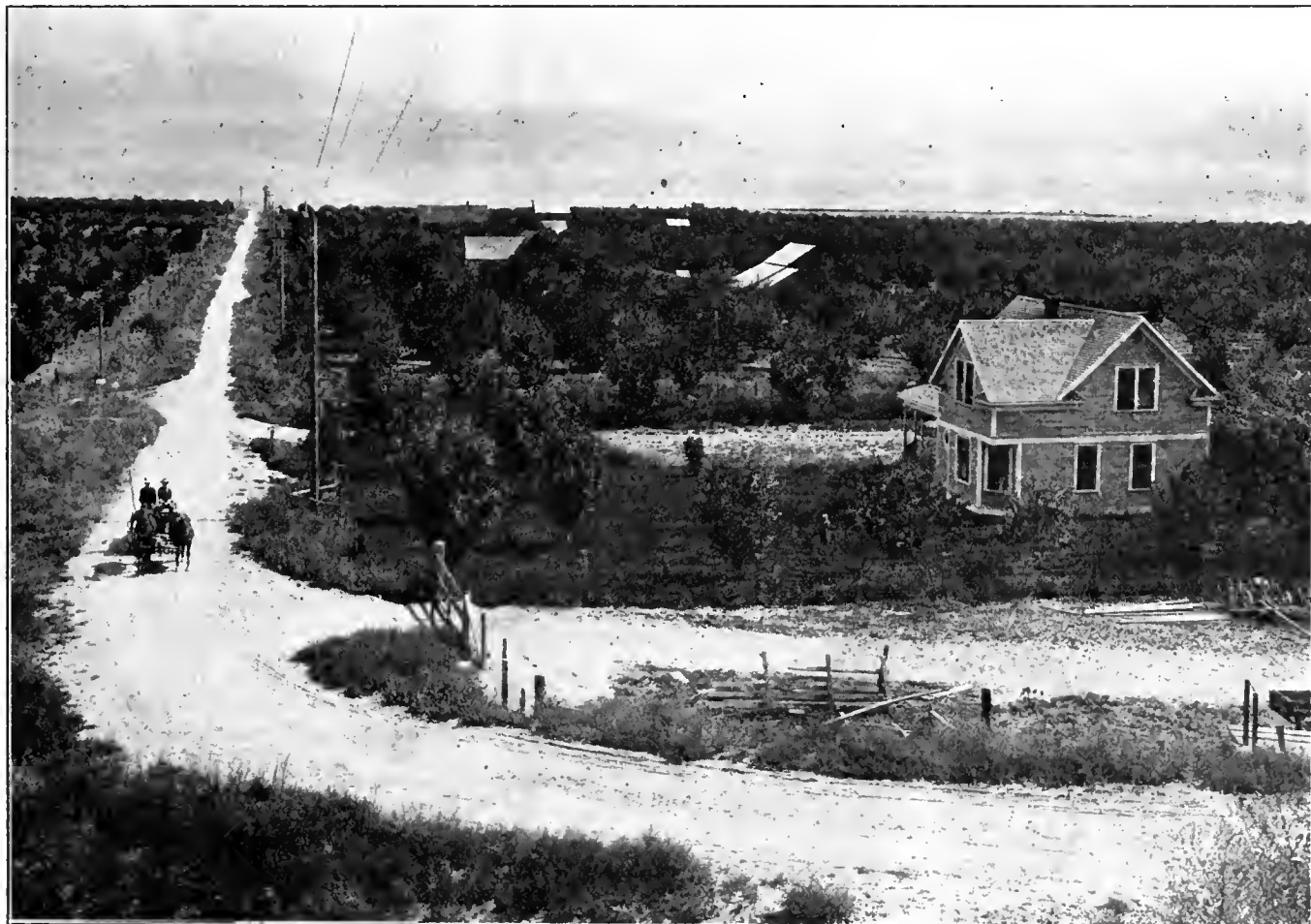
Farm advisers should form a prominent part of successful community development, as outlined by Doctor Mead in the following extracts from the article:

"I went to Palestine from Australia which, all things considered, has given more attention to colonization and has thought out its requirements to its fundamentals more thoroughly than any other country. The plan adopted in Australia, and later copied with great success in California, is to install in each settlement as an adviser a man who has a thorough knowledge of agricultural practice, who has sagacity in business, and personality to lead men to follow him because of confidence in his sympathetic interest and his knowledge of his calling. I have from time to time visited similar settlements in Germany, Denmark, and England, and in all of them the most important individual connected with the colonization is the farmer-adviser.

"A few years ago the Department of Agriculture and Fisheries in England

made a very thorough study of this subject. Their conclusion was that settlements should be made in groups of not less than 100 families, and up to 400 families there is a constant decrease in overhead with no loss of efficiency. Beyond that the power of a single adviser loses itself. He can not give personal attention to the individual.

"In all of these colonies, the idea is to give a man land enough to keep himself and his family fully occupied and to provide money enough to equip the farm so that its cultivator can work with good tools, good stock, and be helped to cultivate with science and skill. These farm advisers can be and are of the greatest possible value in helping people brought together, without previous knowledge of each other, to work together in those things that the community can do better than the individual: Cooperation in buying and selling, in the purchase of livestock and equipment, in financing, things that the community must have, like packing sheds for fruit, cooling and shipping stations for milk, and arrangements for marketing, which will place the man on 10 acres within a colony on an equality with the man owning 1,000 acres outside."



Choice fruit trees on the Okanogan project

## SUGAR-BEET GROWERS MAKE PLANS FOR 1925

A very enthusiastic meeting of the Montana-North Dakota Beet Growers Association was held in Sidney, Mont., on November 26. The meeting was held for the purpose of receiving an announcement by W. L. Lawson, general manager of the Holly Sugar Corporation. Water users and business men from all parts of the Lower Yellowstone project and from the Williston project turned out in such numbers that the Princess Theater was filled to capacity.

Mr. Lawson gave a very interesting and instructive talk on the sugar-beet industry and closed by stating that the Holly Sugar Corporation had decided to erect a 1,200-ton factory on the Lower Yellowstone project [wild applause], work to begin at once.

Contracts for about 9,000 acres of beets on the Lower Yellowstone project and 1,000 acres on the Williston project have been signed up. These contracts run for five years and guarantee a minimum price of \$6 per ton to the growers, with the usual provision for an increase in price,

## DAIRYING PROFITS ON BOISE PROJECT

*Some idea of the profits to be made from dairy cows on the Boise project Idaho, as well as the grade of cows used for dairy purposes, can be had from the report of the Canyon County Cow Testing Association, as follows:*

*"Five hundred cows tested during July averaged a production of 30.4 pounds of butterfat and 767 pounds of milk. The high cow in the test produced 66.4 pounds of butterfat and 1,702 pounds of milk. For the entire 500 animals tested in 38 herds the average profit for the month per cow above the feed cost was \$7.95."*

depending on the net amount received for the sugar. The corporation absorbs all of the freight on beets from both projects.

Great credit is due the factory committee of the local beet growers association for their untiring efforts to get a factory for this project.

## CALIFORNIA PROJECT TO BE INVESTIGATED

A cooperative agreement has been signed by Secretary Work and the Chamber of Commerce of the city of Chico, Calif., for an investigation of a proposed irrigation project in Tehama and Butte counties.

The terms of the cooperative agreement provide that the United States shall make available the sum of \$5,000 immediately upon the deposit by the Chico Chamber of Commerce of a like amount. There is another provision that an additional sum of \$5,000 may be provided by the Government in case an equivalent amount is advanced by the Chico Chamber of Commerce. Under the contract the engineering and other surveys are to be conducted by the Bureau of Reclamation.

The area involved in the proposed project is situated on the east side of the Sacramento River in the vicinity of the city of Chico, which has a population of more than 10,000. Approximately 35,000 acres of land are included in the project and water is to be supplied from Deer Creek and Butte Creek.



Drain digging on the North Platte project

## FRANK W. KIRKSEY

Information has been received of the death on Thanksgiving Day, at his late home in New Rochelle, N. Y., of Frank W. Kirksey, a former employee of the Bureau of Reclamation. Mr. Kirksey was a member of the field auditing staff of the bureau, stationed for some years at Cody, Wyo., during the construction of the Shoshone Dam, and established an excellent record of faithful and efficient service. The sympathy of the bureau is extended to Mrs. Kirksey and the family in their bereavement.

The inhibition in the act of March 3, 1921 (41 Stat., 1353) against the granting of rights of way over public lands within national parks and national monuments without specific authority of Congress, is applicable to the extension of canals for the irrigation of Indian lands, and nothing in the act of August 30, 1890 (26 Stat., 371), reserving a right of way for ditches or canals constructed by authority of the United States, or in the appropriation acts providing for the construction of irrigation works for the benefit of the Indians, grants that authority. (Departmental Decision, June 27, 1924.)

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; F. M. Goodwin, Assistant Secretary;

John H. Edwards, Solicitor for the Interior Department; E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; John Harvey, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

P. W. Dent, Assistant to the Commissioner

C. A. Bissell, Engineer

Hugh A. Brown, Acting Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Acting Chief Engineer; F. T. Crowe, General Superintendent of Construction; J. L. Savage, Designing Engineer; L. N. McClellan, Electrical Engineer; J. R. Ummel, Chief Clerk; Harry Caden, Fiscal Agent.  
George C. Kreutzer, Director of Reclamation Economics; B. E. Hayden, Industrial Agent; C. R. Trowbridge, Inspector.  
D. W. Davis, Director of Finance; W. F. Kubach, Auditor.  
R. M. Patrick and Armand Offutt, District Counsel.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	.....	Brooks Fullerton.....	Mitchell, Nebr.
Boise.....	Boise, Idaho.....	J. B. Bond.....	E. R. Mills.....	C. F. Weinlauf.....	B. E. Stoutemyer.....	Boise, Idaho.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	V. L. Minter.....	V. L. Minter.....	.....	.....
Grand Valley.....	Grand Junction, Colo.....	S. O. Harper.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantioe, Mont.....	A. R. McGinness.....	J. P. Siebenelcher.....	Miss M. C. Simek.....	E. E. Roddis.....	Billings, Mont.
King Hill.....	King Hill, Idaho.....	G. H. Harris.....	E. V. Hillius.....	E. V. Hillius.....	B. E. Stoutemyer.....	Boise, Idaho.
Klamath.....	Klamath Falls, Greg.....	H. D. Newell.....	N. G. Wheeler.....	G. R. Barnhart.....	H. L. Holgate.....	Portland, Oreg.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....	.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	G. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	Andrew Weiss.....	L. H. Mong.....	V. E. Hubbell.....	Brooks Fullerton.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillington.....	C. H. Lillington.....	.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	C. A. Peavey.....	L. S. Kennicott.....	.....	.....
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	Henry Berryhill.....	Brooks Fullerton.....	Mitchell, Nebr.
Salt River <sup>1</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>1</sup> .....	.....	.....	.....	.....
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	W. C. Berger.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	G. C. Patterson.....	C. M. Voyer.....	H. L. Holgate.....	Portland, Oreg.
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Williston.....	Williston, N. Dak.....	W. S. Arthur.....	W. S. Arthur.....	H. C. Meleas.....	E. E. Roddis.....	Billings, Mont.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	C. A. Denman.....	E. M. Phillebaum.....	.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls	American Falls, Idaho	F. A. Banks <sup>2</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>4</sup> .....	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.
Yakima, Tieton Dam	Rimrock, Wash.....	Walter Ward <sup>3</sup> .....	M. J. Gorman.....	C. F. Williams.....	do.....	Do.

<sup>1</sup> Project operated by Salt River Valley Water Users' Association.

<sup>2</sup> General Superintendent and Chief Engineer.

<sup>3</sup> Construction Engineer

<sup>4</sup> Superintendent of Construction.

The NEW RECLAMATION ERA is issued every month by the Bureau of Reclamation of the Department of the Interior, Washington, D. C. It is printed by the Government Printing Office, Washington, D. C.

The NEW RECLAMATION ERA is sent regularly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents per year, payable in advance. Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C., and remittance in the form of postal money order or New York draft should be made payable to the Chief Disbursing Clerk, Department of the Interior. Postage stamps are not acceptable in payment of subscription.



*“OUR country has a well-defined policy of reclamation established under statutory authority. This policy should be continued and made a self-sustaining activity administered in a manner that will meet local requirements and bring our arid lands into a profitable state of cultivation as fast as there is a market for their products. Legislation is pending based on the report of the Fact Finding Commission for the proper relief of those needing extension of time in which to meet their payments on irrigated land, and for additional amendments and reforms of our reclamation laws, which are all exceedingly important and should be enacted at once.”*

*—Extract from the President's Message  
to Congress, December 3, 1924*

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V. 16 NO. 2

Vol. 16 No. 2

# NEW RECLAMATION ERA

VOL. 16

FEBRUARY, 1925

NO. 2



Photo by Army Air Service

MINIDOKA DAM AND POWER HOUSE, MINIDOKA IRRIGATION PROJECT, IDAHO

***T**HRIFT is perhaps more important to farmers than any one else, and among other things means living off the farm as far as possible. The farmer who raises crops to sell and buys flour, canned goods, etc., at the store is swapping \$3 for \$1, and it takes a good business to stand that very long. Selling wheat at 75 cents a bushel, or  $1\frac{1}{4}$  cents per pound, and buying flour at  $3\frac{1}{4}$  cents per pound is one way to lose money, although this is a small matter compared to the difference in cost for package goods. We used to run wheat through a feed grinder and sift out flour, meal, and bran. We also made our own cheese and cured our own ham and bacon. A recently reported farm survey has shown that the farm living, including the house rent, fuel, eggs, milk, meat, vegetables, fruit, etc., used by an average farm family producing diversified crops in the East, would cost from \$75 to \$100 per month if purchased in the city.*

*—R. S. STOCKTON.*



# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

FEBRUARY, 1925

No. 2

## COMMISSIONER MEAD URGES NEED OF PROMPT PAYMENT

*In statement to representatives of irrigation projects in conference at Denver, beginning January 6, Doctor Mead outlines matters for discussion and stresses the necessity of meeting payments as they mature*

PERMIT me to extend to you a hearty welcome and express the hope that your deliberations may be harmonious and of value. If the work of the bureau would permit it, I would be with you, but this is out of the question, and I have written some suggestions intended to help in the work of your conference and in the surveys that it will inaugurate.

This meeting was prompted by a desire to secure the advice and recommendations of many of those who will either participate actively in the surveys to be made, or whose interests will be vitally affected. Constructive suggestions from a practical standpoint will aid in the work which must be done under subsection K of the new law. I therefore earnestly solicit your assistance and cooperation. It will contribute to the preparation of a program for these surveys if each project represented will put in writing a definite statement of the matters which it desires to have considered.

The law recently enacted by Congress embodied most of the recommendations made by the Fact Finders. There is reason to believe that the few omitted will later become part of the law. The act was amended in several features, and the finished product does not include all we had hoped for. There are uncertainties which may be clarified by interpretation on the part of the legal officers of the department.

It must be borne in mind also that certain things may be done under the law, and that others, considered desirable by some, are not within its scope. While I anticipate a full discussion of matters properly to be adjusted and the method best adapted to secure the desired action, may I not express the hope that the conferees will not go beyond the legitimate scope of matters authorized under the law. It should be remembered that adjustments such as those provided for under subsection K must be passed upon by Congress, whose action alone will determine what may be done.

Other important matters are those relating to revision in the method of payments and the operation and maintenance

of projects by the water users as authorized by subsections F and G. This will no doubt receive consideration. Congress has authorized certain forms of relief, conditioned on the water users taking over the operation and maintenance of the projects. The reason for this seems to be a desire to decentralize operation and introduce local responsibility.

### ORLAND PROJECT MAINTAINS RECORD

*Notwithstanding a loss of approximately 60 per cent in crop production last year, the water users' association of the Orland project in California has notified the Interior Department that its operation and maintenance charges for 1924, when due, would be paid in full.*

*The Orland project is the only one of the 25 Federal reclamation projects that has made, without deferment, its regular payments to the Government for annual construction costs and operation and maintenance. During the year 1924 this record was severely tested. On June 7 the reservoir was empty and the project settlers had to go through a rainless summer with no water for irrigation purposes after that date. The result was a loss in crops amounting to approximately 60 per cent, including a reduction in the value and quality of the fruit produced.*

*Although they suffered heavy losses, the settlers on this project met in October and passed a resolution to pay operation and maintenance charges of the current year, without asking for any postponement. This action was based on a desire to keep up the past record of never having failed to pay all amounts due to the Government. Upon receiving notice of the intention of the Orland project to settle, Commissioner Mead of the Bureau of Reclamation expressed his pride and satisfaction over the action of these irrigation farmers in California.*

I wish also to call attention to the unmistakable intention of Congress that operation and maintenance charges hereafter accruing must be paid without delay or extension. Under the new law such charges must be paid in advance in all cases where adjustments are made on old projects or where new projects are initiated. The necessity of this has long been recognized by successful private irrigation enterprises.

It should be, and I believe will be, recognized by the thoughtful that the Reclamation Bureau was not created as a credit agency, as was the Finance Corporation and other agencies which I hope to see active in assisting settlers on our projects in refunding their indebtedness and obtaining money on more favorable terms.

I do not believe that we should contemplate any further measures for blanket relief to projects. Whatever relief is extended should be individual in character and adjusted to meet the needs of each case. The difficulty with blanket relief is that in some cases it extends relief to those who are not entitled to it. I refer to cases where holdings are in excess of the farm unit or irrigable area authorized by law, sometimes acquired by speculators, and where the land is held by non-residents and farmed by tenants. The desire of the bureau is to cooperate with the owners of these properties to promote settlement and make this act conform to its original purpose—the creation of communities where the land will all be farmed by its owners.

It is my desire and that of the Secretary that all adjustments necessary to render it possible for payments to be made by the water users will be made under these surveys and that this will be the end of adjustments. There is a growing alarm in Congress and elsewhere that a disposition exists on the part of some landowners, not always measured by the actual necessities, to evade or unduly postpone payments. Water users may by their cooperation in making payments as they mature contribute greatly toward allaying the feeling of distrust which is now being voiced.

## ECONOMIC ASPECT OF KITTITAS PROJECT, WASHINGTON

*Summary of report by committee of expert advisers shows that the project is permanent and safe from an agricultural standpoint, decidedly attractive, and economically sound and feasible*

### INTRODUCTION

THE study of the soil and economic conditions of the proposed Kittitas unit of the Yakima reclamation project was started early in July, 1924. It covers a thorough study of the soil, agronomic, and economic conditions of the district, though the time at the disposal of the investigators was very short, and the inquiry necessarily is not as detailed as might be possible had a longer time been available. This is particularly true of the soil data, which are based largely on a previous study made by local men, supplemented by considerable field work by those making the present investigation.

The work was carried on by Charles F. Shaw, professor of soil technology, University of California; B. E. Hayden, industrial agent of the United States Bureau of Reclamation; and George Severance, professor of farm management and vice dean of agriculture, Washington State College; with assistance in drainage investigations from L. T. Jessup, senior drainage engineer, United States Department of Agriculture; and in soil investigations from Mr. Henry Holtz, assistant soil physicist, Washington State College. Acknowledgment is due to the many farmers, business men, and citizens of the Kittitas Valley who freely and fully cooperated with the investigators and made possible the accumulation of the detailed information that was needed. Free use was also made of the data available in previous reports by J. R. Sherman and F. C. Kelsey. Acknowledgment is also due to the University of California for the extension of its facilities during preparation of the report and maps.

### SUMMARY

The proposed Kittitas unit of the Yakima reclamation district is located in the central portion of the State of Washington, just east of the Cascade Mountains. It occupies the outer portion of a tilted, basin-like valley, the central portion being already under irrigation.

The topography is reasonably smooth and favorable for irrigation. The elevations vary from 1,700 to 2,100 feet.

The climate is favorable for the production of grain and forage crops. Rainfall varies from 6 to 25 inches in different parts of the project and irrigation is necessary. Winds are severe and persistent in summer.

The irrigation development in the valley has been reasonably successful and shows what can be expected from extensions of the irrigated area.

The duty of water is estimated at 4.286 acre-feet at the point of diversion, or 3 acre-feet delivered to the land.

The soils are generally shallow, underlain by a hardpan resting on gravels, by coarse porous gravels, or by consolidated beds of sands and gravels. The surface soil is of good quality, its producing ability depending upon its depth.

No soil survey was available, but use was made of a "cruise" of a part of the land, supplemented by field study. Measurements showed the following:

Agricultural land:		
Good quality---	20,371.5	
Fair quality----	28,020.5	
		Acres
Pasture land-----	21,925.6	
Total irrigable-----	70,317.6	
Waste land-----	20,071.8	
Total area in district---	90,389.4	

A soil survey, with an accurate soil map supplemented by a detailed topographic map, will be necessary before the actual areas to be included or excluded can be delineated.

Drainage conditions in general are good, though some poorly drained areas will develop.

Most of the land (82 per cent) is in private ownership, 7 per cent is Government land, and 9 per cent belongs to the Northern Pacific Railway and its subsidiaries.

Improved irrigated lands generally are valued at from \$125 to \$350 per acre. Sagebrush desert land is valued at from \$5 to \$15, with some held at much higher prices.

The valley is devoted mainly to the production of grass and grain in about the following proportions: Alfalfa, alfalfa and timothy, or timothy occupies 48 per cent of the land; wheat, 21 per cent; oats, 11 per cent; and pasture, 13 per cent, on good irrigated farms.

Crop yields are high, wheat normally yielding from 40 to 70 bushels, oats, 60 to 100 bushels; and hay, from 1½ to 5 tons.

Most of the hay and grain is shipped out of the valley, the Puget Sound district affording a ready market, probably capable of considerable expansion, sufficient to absorb the added production of the proposed area.

Dairying is successful but not extensive in the valley. It will become more extensive as the price of hay may decrease. Good prices have been received for butter, cream, and cheese.

Range cattle and sheep in considerable number are fed and wintered over in the valley and afford a local market for hay.

Eighty to one hundred acres seem to be the most common and popular size of farms, with 160 to 200 acre farms frequent.

The minimum cost of improvements, stock, and tools for an 80-acre farm is approximately \$4,500, while the purchase and clearing of the land will cost from \$1,500 to \$8,000, making a cost of an equipped and stocked farm of 80 acres lie between \$6,000 and \$12,000.

The gross annual income after the plant is in full operation should lie between \$2,500 and \$3,500.

Settlers should have an initial capital of at least \$2,500. With less than this their chance of success is slight unless special long-time loans at low rates of interest are made available, and lands are purchased at very low prices. If partially developed lands are purchased at from \$50 to \$100 per acre, the settler needs \$4,000 to \$6,000 capital in order to be reasonably sure of carrying through the development period.

The existing irrigation districts are in good financial condition and the farmers generally prosperous.

Bonded indebtedness is low. Lands are assessed on the basis of 40 per cent of their value. Taxes are moderate and delinquencies are small.

Mortgages are apparently stabilized without material increase or decrease and with about \$1,000,000 outstanding, bearing interest at from 5½ to 7½ per cent. Foreclosures are few and the amount generally low.

Credit facilities are fairly good, the local banks having considerable funds available for short-term loans and some for long-time funded debts. Outside capital must be supplied to carry the settlers through the development period.

Educational and social conditions are good and capable of expansion to care for additional population.

The communities are healthful, with no chronic diseases peculiar to the region.

The cost of the project has been estimated at \$8,755,850.11. The gross annual income after full development is estimated at \$1,828,298.90. By a pay-

ment of 5 per cent of the gross returns each year, there would be available annually the sum of \$91,414.95. With adjustment for the period when the land will not be producing full income, the time for full repayment is found to be 96.3 years.

### CONCLUSIONS

The area is well located, with a source of water apparently adequate, good climate, and good living conditions.

The soils are of good quality, but are shallow. Crop yields are surprisingly large in view of the depth of the soil.

Grass and grain are the present crops, and there is little probability of any material change, though the production of apples, pears, small fruit, and potatoes may be somewhat extended, and sugar beets are a remote possibility.

Dairying should be encouraged, both to make sure of a market for the forage crop and also to maintain the soil fertility. Continuously selling hay and grain will certainly deplete the soil and materially reduce crop yields.

Farm units should rarely be less than 80 acres in extent on the best-grade soils. Where the areas of poorer soils are considerable, 160 acres or more may be needed to make a farm that will yield an income for a family.

The cost of improvements, stock, and tools will vary from \$4,000 to \$6,000, while the land when cleared and smoothed (or purchased partially developed) will run from \$20 to \$100 or more per acre. The gross annual income after the farm is in full operation will probably be between \$35 and \$40 per acre for the good land, \$25 to \$35 for fair land, and \$8 to \$12 for pasture and other poor land. The average for tillable land should be about \$35 per acre.

The minimum capital for a settler is felt to be not less than \$2,500, and with this amount he must purchase desert land at wholesale prices (\$8 to \$12 per acre) and be given very liberal treatment by the local banks and implement dealers. If higher prices are to be paid for the land, the settler must either have an initial capital of from \$4,000 to \$6,000 or must be financed from Government or State sources at low interest rates and on long terms of repayment.

Much of the land under the Main Canal has a cover of stumps, brush, and trees, and an estimated period of 25 years will elapse before these lands are cleared and brought to full production. During this period the estimated gross annual production of this division varies from \$77,400 to \$174,560. The lands under the South Branch and North Branch Canals

should be settled and in full production within five years after water is available, and they are estimated to give annual gross returns of \$354,800.57 and \$1,298,938.33, respectively.

The cost of the project has been estimated at \$8,755,850.11. A repayment of 5 per cent of the gross annual income would return a total of \$2,236,760.62 during the first 25 years, with \$91,414.95 repaid annually thereafter. On this basis the project would repay the full cost of construction in 96.3 years.

The type of agriculture developed in this valley will attract a high quality settler and should result in the establishment of a permanent and substantial farm community. Homes will be available for between 450 and 500 families, and foodstuffs and feed with an annual value of over \$1,828,000 will be produced.

While the period of repayment is long, the project is permanent and safe from an agricultural standpoint, decidedly attractive from the viewpoint of health, educational, and social conditions, and is considered to be economically sound and feasible.

CHAS. F. SHAW,  
*Soil Technologist,*  
*University of California.*

B. E. HAYDEN,  
*Industrial Agent,*  
*Bureau of Reclamation.*

GEO. SEVERANCE,  
*Specialist in Farm Management,*  
*College of Agriculture, Pullman, Wash.*

### LOCAL INDORSEMENT

ELLENSBURG, WASH.,  
November 15, 1924.

Dr. ELWOOD MEAD,  
*Commissioner, Bureau of Reclamation,*  
*Washington, D. C.*

\* DEAR SIR: The local committee appointed to review the report on the soil and economic conditions of the Kittitas unit of the Yakima project, prepared by Professor Shaw, Professor Severance, and Mr. B. E. Hayden, submit the following for your consideration:

We approve the report as a whole and wish to express our appreciation of the work done by the authors in collecting and compiling the data in the limited time at their disposal. The methods used are excellent and the results conservative. All computations are based on the provisions of the pending law, which provides for a repayment charge of 5 per cent of the gross annual production as determined by the Secretary of the Interior annually. It is obvious that any computation of repayment depends primarily on the interpretation of what is meant by "gross re-

ceipts," and lacking an exact definition of the term various values can be determined from the same data, depending on local opinion and customs. The committee must depend on the experience and practice in the Kittitas Valley.

In the discussion of the various items of the report, it is the purpose of the local committee to amplify the report from their local experience, with no thought of criticism or consideration of general policies outside of this particular unit of the Yakima project.

*Location and established conditions.*—Particular attention is called to the advantageous location of the Kittitas unit, which occupies the upper valley of the Yakima River just east of the Cascade Mountains, the center of the unit being but approximately 100 miles distant from Puget Sound, with exceptional transportation facilities. The elevation of the project varies from 1,500 to 2,200 feet above sea level.

The climate is moderate and healthful and is well suited to the production of agricultural crops and stock raising.

There is already developed a considerable portion of the valley, and the towns are well established. Nearly 60 per cent of the land included in the Kittitas reclamation district has been improved and is producing partial crops. Roads and schools have been built and are in use, and telephone lines reach all parts of the valley. Power and light lines serve a considerable portion of the rural population.

Educational and social conditions are excellent. In addition to the common schools, there are high schools at Kittitas, Ellensburg, Thorp, Cle Elum, and Roslyn, and at Ellensburg is located the State normal school, which has a large attendance. Churches and community centers are located at convenient points.

The financial conditions are exceptionally good and the present agricultural portions of the county prosperous. The farmers have all come through the period of agricultural depression in fine shape. This is shown in a striking manner by the report in the statements as to mortgages, bonded indebtedness, and taxes. Particular emphasis should be placed on the low bonded indebtedness of the county, especially as regards roads and schools. As a result of these conditions taxation is comparatively low. We believe this to be a most excellent showing.

*Present irrigation development.*—The irrigation development of the Kittitas Valley commenced in 1872, when the Manastash Canal was built to serve approximately 1,700 acres of land on the south

(Continued on page 20)

## LOCAL COMMITTEE STRONGLY INDORSES THE PROJECT

*Believes that the economic committee has been very conservative in their presentation of facts, and concurs in the statement that the project is economically sound and feasible*

(Continued from page 19)

side. Since that time various other canals have been built, both from side streams and the Yakima River, and at present approximately 60,000 acres are under ditches. Of this land about 29,000 acres have a full water right and obtain their water from the Yakima River, and the remainder is irrigated from the side streams with only a partial water right. The Kittitas reclamation district only covers those lands which lie above the present river ditches.

**Soil classification.**—The basis of soil classification used in the report was a soil cruise made for assessment purposes, checked and extended by the authors of the report. In this classification classes 1, 2, and 3 are considered possible of full use for agricultural purposes, classes 4 and 5 are considered available for pasture, and class 6 as of no agricultural value.

The committee is of the opinion that the authors have been too conservative in their estimate as to the production that can be expected from the land classed as Nos. 4 and 5.

The graphical representation of the proportion of the different classes of land, as shown in the chart prepared by Professor Shaw, indicates very clearly that the greater part of the class 4 and class 5 land is distributed throughout the valley. Nearly every farm has a few acres of these classes,

and where the land is now cultivated it is difficult to distinguish the difference in crop production on the various classes.

Even on class 6 land, which is characterized as having no agricultural value, there are instances (shown to Mr. Hayden) of a production of 3 tons of alfalfa per acre annually. The data from which the percentage of crops grown under full water right was determined were compiled from a survey of 40 farms, nearly all of which contained some of the lower classes of land. Although the area of these inferior classes was contained in the total acreage and the percentage of crops determined on such total, the application of the table is only made on the three higher classes. If the proper credit was given to the area of lower class included, the subsequent computations would undoubtedly show higher production from all classes.

While there are instances of production from areas of class 6 land, as stated above, the committee concurs with the report that this class should be excluded and no provision made for the irrigation of same. This can be done very readily, as most of the class 6 land lies in relatively large bodies, especially in the vicinity of Reeceer Creek, and is not scattered throughout the irrigable area.

The committee also concurs with the report in the statement that a careful soil survey should be made, with an accurate soil map showing the location and extent of every body of each soil in the area to be included.

**Character of agriculture.**—The report considers only the production of hay and grain, pasture, and a small area of miscellaneous crops. While it is evident that the greater portion of the land in the district will be devoted to these crops, it is also true that under the existing canals other crops are grown which constitute a substantial portion of the total production, and in all probability these crops will be grown in much the same proportion on the adjacent lands of the Kittitas reclamation district. Orchards on a commercial basis constitute at present about 2 per cent of the cultivated land of the valley having a full water right. Small fruits, potatoes, onions, corn, and garden products are grown generally and cover a considerable total area. One of the important sources of revenue is the sale of pasture on hay land after the crop is taken off. In the Kittitas Valley only two crops of hay are cut and the third crop pastured. Sale of this pasture brings from \$2 to \$10 per acre annually. Sale of straw after threshing the grain has also



A sample of the kind of oats grown in the Kittitas District, Yakima project, Wash.



been a steady source of revenue. We are of the opinion that a consideration of these items would materially shorten the estimated period of repayment.

*Prices of products.*—The committee is not yet certain as to the meaning of the term "gross receipts" as used for determining the amount of the annual construction repayments under the pending law. The natural assumption of the committee is that it would mean the total amount received by the farmers for all their products. In this locality the hauling of products to shipping point and the preparation of products into merchantable shape has always been considered a legitimate part of the cost of farm operations. As most of the hay and grain is shipped from the valley, this is always considered as hay baled and grain sacked f. o. b. shipping point. The authors of the report take a different viewpoint and endeavor to place a value at the farm. It is difficult to tell just where to make a division between farming and marketing operations, especially as applied to dairying, livestock raising, and the production of high-priced crops. Any estimate of returns will be affected by different assumptions and the repayments accordingly. This is mentioned as one of the problems which has confronted the committee in estimating the time of repayment. On our assumption a much shorter time will be required for complete repayment than that given in the report.

In considering the trend of the price of hay on the Pacific coast during recent years, the only authentic data available to the committee is the fact-finding report, which gives the average price of alfalfa on all reclamation projects from 1912 to 1922 as \$11.25 per ton and the average prices of those projects west of the Rocky Mountains as \$11.47 per ton. The prices given in the report as local prices are for the four years 1920 to 1923, inclusive, a period of general agricultural depression. The committee feels, therefore, that the authors are too conservative in their estimates of future prices.

*Transportation and markets.*—The Kittitas Valley has exceptional advantages, due to the proximity of Puget Sound transportation facilities, and available markets.

Two transcontinental railroads cut through the district, and shipping points will be in close proximity to all project lands. In addition, excellent highways, both State and county, reach to all portions of the irrigable land.

Due to the closeness to market and transportation facilities, the Kittitas Valley farmer has received more per unit for his produce than most of the farmers in other irrigated sections. With expand-

ing markets the advantage will undoubtedly increase.

*Estimated repayments.*—As set forth in the preceding paragraphs, the committee is of the opinion that the authors' estimate of the amount and time of repayments of the construction charge is very conservative and believes that the amount of annual gross production and annual repayments will be greater and the time of complete repayment shorter than is indicated by the report.

We believe and hope that future prices received for farm products will be more than have been obtained during the past four years, and we are confident that better production can be achieved with competent advice and sufficient water supply.

*Amount already expended.*—We wish to call attention to the fact that while the estimated cost upon which repayment is to be made is \$8,755,850, there has already been expended by the United States approximately \$1,794,427 in the construction of the reservoir system and storage works. On this amount no repayment can be expected until after the construction of the distribution system.

*Cut-over land.*—The report shows that there are 6,090 acres included in the irrigable area served by the Main Canal, and the authors estimate that a period of 15 years will elapse after repayments commence before this land is fully cleared and producing crops. This would be 20 years after water is available for irrigation.

The experience of the committee indicates that this land will be put into cultivation in a shorter period, as all lands now cleared in this area and large areas adjacent, especially the Teanaway district, were cleared and cultivated as quickly as water was available.

*Sources of credit.*—The possible sources of credit for the prospective settler as given in the report include the following:

1. Federal land banks.
2. Livestock corporations.
3. Local banks.
4. Insurance, mortgage companies, and private individuals.

The committee is of the opinion that, in addition to these, special attention should be called to the statement relative to the land settlement law of the State of Washington. It is believed that the provisions of this law furnish a very important source of possible credit for the settlers on the Kittitas unit.

*Higher repayment rate.*—The report has been prepared on the basis of the pending law, one of the chief provisions of which provides for the repayment of the construction costs at the rate of 5 per cent of the gross annual production. It is

the opinion of the committee that the Kittitas unit could very easily pay this, or even a higher rate of repayment without placing an undue burden on the water user.

Probably the best comparative data of the ability to make repayment is afforded by the records of the Cascade irrigation district, which lies adjacent to the lands to be served by the proposed North Branch Canal. Conditions generally and soil classification are practically the same in both areas. All classes of soil are assessed equally under the Cascade Canal and the amount per acre paid for water charges and interest for the past six years has averaged in excess of \$5 and for the years 1919 and 1920 was in excess of \$6. The Cascade district is in excellent financial condition, with bonds at the present time selling above par. There are few delinquencies, only \$10,787 in uncollected assessments outstanding for the current year according to the books of the secretary, and the secretary states that the treasurer has received the greater part of this amount, although it is not yet credited on the secretary's books. Since the district was formed there has been no land included sold for unpaid water assessments.

*Conclusion.*—The data and facts presented in the report are of much value and the authors are to be congratulated upon securing so much in so short a time. The committee wishes to be thoroughly understood that in the above discussion there is no thought of criticism, but it also feels that the authors are very conservative in their computation of results. We thoroughly concur in the statement of the authors of the report that—

"While the period of repayment is long, the investment is felt to be absolutely safe. The soils are good, and there is no probability that any serious unfavorable conditions may arise in the future. The crops grown are staples, in constant demand, insuring a permanent market. Irrigation and subdivision of these lands will provide between 450 and 500 farms, with an annual production of over \$1,828 worth of foodstuffs. The character of the agriculture and attractiveness of the region should bring in a high type of settler and should result in the establishment of a permanent and substantial farm community.

"In the light of these conditions, the project is considered to be economically sound and feasible and worthy of construction and development by the Government."

Respectfully submitted.

JOHN N. FAUST.  
PHIL H. ADAMS.  
A. L. B. DAVIES.  
BRUCE BONNY.

## TURKEY GROWING ON THE MINIDOKA PROJECT, IDAHO

*E. B. Darlington, superintendent, tells about this growing industry which is helping to meet the demand for the holiday birds and is bringing ready cash to many progressive farmers on the project*

ON the Minidoka project, Idaho, the past year was favorable for turkey raising, and that enterprise became an important part of the industry on many farms. As the birds developed in size they became conspicuous, and the large number and wide distribution of the flocks were manifest. It was not uncommon in driving over the project to come upon droves of several hundred, but the average farm flock was probably not over 50 turkeys.

D. L. Carlson, whose 40-acre farm is 5 miles northeast of Rupert, managed a flock of 700 bronze turkeys in 1924. About 625 of the holiday birds were hatched during the year, the remainder being old hens and gobblers. Mr. Carlson's forty is very well adapted to turkey growing, being in a territory of clean, sandy soil, with close access to free range, adjacent to running water in a large project lateral and yet not in the "subbing" district, where dampness might be detrimental to the health of the stock.

The Carlson turkeys did so well in 1924 that this grower is now planning to go into the business on a larger scale. He believes that on 80 acres along the project boundary, where the birds can be ranged on unentered public land, he can successfully raise at least 1,000 turkeys. This number in his estimation would justify the employment of a herder, who could drive the flock to and from the range and devote his entire attention to the care of the birds.

In summer the turkeys require very little feeding, their diet consisting largely of weed seeds, green feed, grasshoppers, and other insects. However, Mr. Carlson last year fed some wheat throughout the summer to keep the flock in good tone. As the holiday season approached and fattening became desirable, a mixed ration of corn, cooked potatoes, and wheat was fed. The potatoes were boiled in a home-made cooker improvised from old oil barrels, and the birds were permitted to peck at this cooked food whenever hungry. They ate it with apparent relish. Shell, grit, and charcoal were made available at all times.

Sitting hens were kept in individual pens, each turkey hen covering about 18 eggs. The nests were on the ground, but the pens were so arranged that the hens while sitting could be protected from the sun and from disturbance by the other turkeys. On the Carlson farm 50 hens were set and about 625 young birds brought to maturity. It is therefore apparent that the ratio of grown stock to eggs set was close to 70 per cent.

Another large flock of turkeys was raised by Mr. and Mrs. A. W. Posey on an 80-acre farm 2 miles south of Springdale in the South Side pumping division. The Poseys brought about 500 turkeys through the season out of 1,050 eggs hatched. Heavy losses occurred on account of coyotes, theft, and road traffic. The Posey farm is bounded on two sides by graveled highways and automobile

traffic is quite heavy. A considerable number of the poults were killed by passing cars, and several matured turkeys were run over by careless drivers.

Mrs. Posey set 98 hens. Their nests were made on the ground and no pens were used, but the hens were separated by wire netting. Many of the nests were stolen, but whenever possible to find the hidden clutch the eggs were gathered and the hen provided with a setting in a protected place where care could be given her.

The young turkeys were fed cottage cheese, mixed with a little black pepper; hard-boiled eggs, shells and all; and some grain. At fattening time sugar beets were cut up and fed with corn and wheat. The mature turkeys were not fed during the summer, but were allowed to roam at will. Mrs. Posey believes that the damage the birds do to growing crops is more than offset by their destruction of insect pests. The foraging turkeys keep down bugs of all kinds. She states that the alfalfa crop on their farm was better this year than ever before and attributes the improvement in large part to prevention by the turkeys of injury through the ravages of weevil and grasshoppers.

At evening the turkeys were brought into the farmyard and went to roost upon a large open-air rack made of poles. When the flock of 500 turkeys was banked upon the roost for the night, it was a sight frequently remarked upon by people driving by. The birds seemed not to suffer

(Continued on page 23)



1. Individual pens for sitting hens, Carlson ranch. 2. Sandy feeding ground, Carlson ranch. 3. Feeding the flock, Posey ranch. 4. Mrs. Posey with her flock

## DR. MEAD RECEIVES NEW HONORS

**D**R. ELWOOD MEAD, Commissioner of the Bureau of Reclamation, has received a commission from the President designating him a special commissioner on the part of the United States to cooperate with representatives of Mexico in a study of the equitable use of the Rio Grande below Fort Quitman, Tex. At the request of the President, Doctor Mead will act as chairman of the commission. The letter from the Secretary of State designating Doctor Mead follows:

DEPARTMENT OF STATE,  
Washington, January 6, 1925.

ELWOOD MEAD, Esquire,  
Commissioner, Bureau of Reclamation,  
Department of Interior,  
Washington, D. C.

SIR: I take pleasure in enclosing the commission of the President designating you a special commissioner on the part of the United States to cooperate with the representatives of the United Mexican States in a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Tex. The President has also designated Mr. W. E. Anderson, of La Feria, Tex., and Gen. Lansing H. Beach, United States Army, retired, as members of the commission. It is the wish of the President that you shall act as chairman.

There is also enclosed for your information a copy of the act approved May 13, 1924, providing for the creation of the commission.

The American Embassy at Mexico City

### MINIDOKA TURKEYS

(Continued from page 22)

from the exposure even during the period of bitterly cold weather in December, when a subzero temperature of  $-28^{\circ}$  F. was reached.

The Poseys sold nearly 400 of their birds for holiday shipment, receiving an average of 21 cents per pound live weight on 4,500 pounds of turkey. They retained 100 hens as a nucleus for next year's flock. A few were sold locally.

It is estimated that 10,000 dressed turkeys had been sold off the project by New Year's Day in addition to the local consumption. Three full carloads were shipped, together with several broken consignments. An average of 28 cents per pound was received. The early shipments went to Chicago and farther east, but later in the season this project's turkeys were largely absorbed by California markets. The demand for Idaho poultry is not restricted to the holiday season, and many orders for Minidoka project turkeys are filled after the holidays are over. Many people prefer the later birds because in general they are in better condition.

has been instructed by telegraph to ascertain when and where it will be possible for the Mexican representatives to meet your commission. The department will acquaint you with the substance of the embassy's reply as soon as it shall have been received, and a further communication will be addressed to you in due course as to the date on which you will assume your duties.

A similar letter has been sent to Messrs. Anderson and Beach.

I am, sir, your obedient servant,  
CHARLES E. HUGHES.

### THE ACT

The act referred to is as follows:

An act providing for a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, in cooperation with the United States of Mexico.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President is hereby authorized to designate three special commissioners to cooperate with representatives of the United States of Mexico in a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, with a view to their proper utilization for irrigation and other beneficial uses. One of the commissioners so appointed shall be an engineer experienced in such work. Upon completion of such study the results shall be reported to Congress.*

*Sec. 2. The sum of \$20,000 is hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated for carrying out the provisions hereof.*

Approved, May 13, 1924.

CLIVIN COOLIDGE,

President of the United States of America.

To all who shall see these Presents, Greeting:

KNOW YE, That reposing special trust and confidence in the Integrity and Ability of Elwood Mead, of California, I hereby designate him a Special Commissioner on the part of the United States of America to cooperate with representatives of the United States of Mexico in a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, and do authorize and empower him to execute and fulfill the duties of this commission, with all the powers, privileges and emoluments thereunto of right appertaining during the pleasure of the President of the United States.

IN TESTIMONY WHEREOF, I have caused the Seal of the United States to be hereunto affixed.

DONE at the City of Washington, this twenty-seventh day of December, in the year of our Lord one thousand nine hundred and twenty-four, and of the Independence of the United States of America the one hundred and forty-ninth.

By the President:

*Charles E. Hughes*  
Secretary of State.

## DENVER CONFERENCE TO HAVE FAR-REACHING RESULTS

*Delegates from virtually all the irrigation projects of the Bureau of Reclamation meet in harmonious session for discussion of the new reclamation law and formulation of constructive resolutions*

"A NEW and better day has come to Federal Reclamation," said one of the delegates to the Denver Conference on Reclamation. This statement expressed the sentiment of all the delegates. Everybody was looking forward. The difficulties of the past were referred to only as lessons for the future. Confidence in the management of the Bureau of Reclamation, in the feasibility of the new reclamation law, and in the willing cooperation of the water users was freely expressed. Constructive suggestions were made from the beginning to the end of the conference. The new law was analyzed in terms of project experience and was found good. The resolutions adopted by the delegates will be useful in working out the problems of Federal Reclamation. Seldom, if ever before, has so helpful a gathering of Federal water users been held.

The conference convened upon call of Dr. Elwood Mead, Commissioner of Reclamation. The delegates were called to order at 10 a. m. January 6, 1925, by Acting Chief Engineer R. F. Walter, as pressing duties in Washington, where Congress was in session, made it impossible for the commissioner to be present. Gov. Thomas E. Campbell, chairman of the "Fact Finding Commission," acted

as permanent chairman, and Dr. John A. Widtsoe served as secretary.

The keynote of the conference was sounded by Dr. Elwood Mead in a letter addressed to the conference, elsewhere published in this issue. The following telegram was received from the Secretary of the Interior, Dr. Hubert Work:

WASHINGTON, D. C.,  
January 5, 1925.

Hon. THOMAS E. CAMPBELL  
Care Reclamation Bureau,  
Wilda Building, Denver, Colo.:

Please for me extend to the Denver Conference on Reclamation my congratulations and best wishes for successful meeting. It promises cooperation with the department necessary to the success of the new policy intended to reclaim reclamation to those for whom it was originally intended, for those who have settled and developed the land, for a sound and equitable financial policy to secure ultimate refund to the Government of its investment in reclamation less construction charges, if any, which may have been inequitably laid against projects. Suggestions and proposals for the effective administration of the new reclamation law are invited and will be carefully considered. Cooperation by the water users with the forthcoming appraisers of projects will be appreciated. I am hopeful that local responsibility in the operation and maintenance of projects

may be promptly assured, that all projects may be operated by those who live on them and for whom they were constructed.

HUBERT WORK.

The communications from Secretary Work and Commissioner Mead received hearty response from the delegates.

The attendance from the projects was made up almost entirely of accredited delegates from recognized project organizations of water users. Only five delegates failed to present satisfactory credentials. Consequently it was an official gathering, possessing authority to speak for the projects. Twenty-one projects were represented, and communications were received from the others, explaining their nonrepresentation. A number of visitors were also present. The Bureau of Reclamation and the Department of Agriculture had several representatives present. Governor D. W. Davis, Director of Finance; Geo. C. Kreutzer, Director of Reclamation Economics; and Acting Chief Engineer R. F. Walter represented their respective divisions in the bureau and took vigorous parts in the discussions. The attendance as registered follows:

### REPRESENTATIVES OF PROJECTS

*Belle Fourche project.*—W. D. Buchholz.



Delegates to the Reclamation



*Boise project.*—Fred Harrington, H. A. Griffith, and L. J. Magee, representing one board of directors of the Boise-Payette Water Users' Association.

T. W. Tarr and Walter Griffith, representing another board of directors of the Boise-Payette Water Users' Association.

Chas. G. Allen, representing the Hillcrest Extension.

G. A. Remington and H. L. Randall, representing the Nampa-Meridian irrigation district.

Edward Smith and W. H. Thompson, representing the New York Canal Co.

John C. Rice, representing the Black Canyon, Pioneer, and Emmett irrigation districts.

W. B. Mitchell, representing the Farmers' Cooperative Ditch.

David Kennedy, representing the Dry Lake section.

*Grand Valley project.*—D. W. Aupperle; C. J. McCormick, representing the Orchard Mesa district.

*Huntley project.*—A. L. Makinson, representing the Prior Division. O. P. Pessman, representing the eastern division.

*King Hill project.*—F. L. Kinkade and Charles Stout, representing the King Hill irrigation district.

*Klamath project.*—A. L. Wishard.

*Lower Yellowstone project.*—Burton Adams, representing the Lower Yellowstone irrigation districts Nos. 1 and 2.

*Minidoka project.*—W. C. Paul and R. L. Willis, representing the Gravity Division.

W. L. Manning and George Durfee, representing the South Side irrigation district.

*Newlands project.*—Roy W. Stoddard representing the Truckee-Carson irrigation district.

*North Platte project.*—C. W. Scoville, representing the Interstate Division.

Jas. T. Whitehead, Wm. Morrow, and Chas. Kearney, representing the North Platte Water Users' Association.

Mark Spensville, C. H. Silvernail, and R. H. Willis, representing the Northport Division.

A. M. Mathers, representing the Gering-Fort Laramie irrigation district.

R. F. Tebbet and P. T. Lehmer, representing the Goshen irrigation district.

*Okanogan project.*—John S. Peterson, R. C. Rasmussen, B. E. Hendrick, and E. D. Clough, representing the Okanogan irrigation district.

*Rio Grande project.*—J. W. Taylor, representing the Elephant Butte irrigation district.

Roland Harwell, representing the El Paso Water improvement district.

*Riverton project.*—O. M. Gibson, representing the Midvale irrigation district.

Walter Warren, Midvale district.

*Shoshone project.*—C. M. Davis, representing the Frannie division.

Earl Murray, representing the Garland division.

N. A. Nelson.

*Strawberry Valley project.*—K. F. Keeler, Lars P. Larson, A. R. Creer, D. P. Brinton, and Lee R. Taylor.

*Sun River project.*—G. A. Conrad, representing the Fort Shaw division.

*Umatilla project.*—K. F. McNaught, representing the Hermiston irrigation district.

C. E. Glasgow, representing the West Extension irrigation district.

*Uncompahgre project.*—Frank Meaker, William P. Dale, Charles J. Moynihan, Frank D. Catlin, F. E. Spencer, and John J. Tobin.

*Yakima project.*—F. E. Fyfe, E. C. Houston, and W. L. Barker, representing the Sunnyside Valley irrigation district. Mr. Barker also represented the Outlook pumping plant.

B. Hixson, representing the Grandview pumping plant irrigation district.

Stephen J. Harrison, representing the Sunnyside (Benton) irrigation district.

C. P. Wickersham and W. E. Thompson, representing the Tieton division.

A. B. Delp, representing the Snipes Mountain irrigation district.

*Great Salt Lake Basin project.*—Lloyd Garrison, state engineer; Joseph Murdock, Southern division; W. O. Creer, J. W. Alleman, J. B. Tucker, and E. L. Burgon.

*Williston project.*—Burton Adams.

George A. Fisher, Strawberry Valley Grazing Co.

A. C. Cooley, in charge agricultural demonstrations on reclamation projects, Bureau of Plant Industry, United States Department of Agriculture.

(Continued on page 26)



Denver, Colo., January 6-9, 1925

## DELEGATES DISCUSS PROVISIONS OF NEW LEGISLATION

*The act is taken up section by section for extended and constructive consideration by the delegates, culminating in the adoption of a number of resolutions*

(Continued from page 25)

R. P. Teele, Census Bureau.

A. L. Fellows, Department of Agriculture.

R. L. Parshall, Colorado State Agricultural College.

*Bureau of Reclamation.*—D. W. Davis, director of finance; R. F. Walter, acting chief engineer; George C. Krentzer, director of reclamation economics; Andrew Weiss, assistant director of reclamation economics; B. E. Stoutemyer, district counsel, Boise; J. R. Alexander, district counsel, Montrose, Colo.; R. M. Patrick, district counsel, Denver; Armand Offutt, district counsel, Denver; J. B. Bond, superintendent, Boise, Idaho; L. H. Mitchell, superintendent, Powell, Wyo.; L. J. Foster, superintendent, Montrose, Colo.; William S. Arthur, superintendent, Williston, N. Dak.; C. A. Lyman, repayment accountant, Denver; J. R. Ummel, chief clerk, Denver; W. A. Meyer, fiscal inspector.

The conference continued until Saturday. Late Thursday afternoon the delegates from the projects took charge of the meeting to formulate their resolutions, while Governor Campbell, Doctor Widdsoe, and bureau representatives met with the various project delegations to discuss matters not of interest to the whole conference.

The purpose of the conference had been tersely stated by Commissioner Mead in the official call:

The purpose of this conference is to consider the matters that are to be dealt with in determining the readjustment of project costs and the relation of the projects to the Government under the provisions of H. R. 9559, recently passed by Congress. Among the matters to be dealt with are:

(a) Number of zones and basis of classification of land to secure, as near as may be, equality of conditions in the payment of project costs on the basis of 5 per cent of the crop returns.

(b) To determine the acreage of land now included in the project that ought to be excluded and relieved from all obligations to pay project costs.

(c) The willingness or unwillingness of the water users to organize a district and as a district to take over the management and control of the project as provided for in subsection G of section 5, of the above-mentioned act.

(d) Any other matters which the water users may desire to bring up for consideration at the conference.

### DISCUSSION OF THE ACT

The conference, therefore, considered section by section, the new reclamation act (H. R. 9559) passed by Congress last December.

It was the consensus of opinion that the provisions of the act relating to new projects will safeguard the water users on such new projects against most of the difficulties that have attended the settlers on the older projects. Especially did the conference agree that a careful and exhaustive study should be made of the possibilities of any proposed project before authority to construct it is requested. The section providing for two public notices was also looked upon with favor.

The first discussion of the sections dealing with existing projects, centered upon subsection F, which provides that hereafter all project construction charges shall be made payable in annual installments of 5 per cent of the average gross annual acre income. With only two exceptions the projects declared that the new method of repayment would be beneficial to the water user. Some misunderstanding existed as to the method of determining the basis upon which the charges are to be made. This led to an exhaustive discussion of methods of classifying project lands on the basis of productivity. The land-classification methods employed by the North Platte project, and more recently on the Shoshone project, were considered in detail, and the conference concluded that a land classification using essentially the methods followed on these projects would be acceptable to all the projects for the purpose of establishing a basis for the annual repayments under the new law.

It was also made clear that the basis upon which any individual farmer is to make his repayments under the new law is that of the zone, division, or class to which his lands belong, and that no attempt will be made to maintain individual crop production accounts for this purpose. The discussion made clear that water users, specializing in intensive crops, would not have to bear an unduly heavy annual construction charge, since their production record would be averaged with all the production records of the same class of lands. The delegates expressed the opinion that even under the new law the period of deferment as provided, would have to be asked for by many projects.

Much discussion resulted from the reading of subsection G, which provides that if a project, two-thirds of which is covered by water-right contracts, is to benefit under the new repayment law, the

management of the project must be taken over by a legally organized water users' association or irrigation district. An almost unanimous desire was expressed by the water users to take over the management of their projects. It seemed to be the sense of the conference, by a motion which does not appear in the final resolutions, that there is no objection to a joint liability clause in any contract turning over the projects to the water users, providing that any water user who completes his payments may, upon such completion, receive title to his land and water without further liability for the water users who have not yet paid out. In view of the fact that a number of provisional contracts have been formulated for the taking over of projects by water users, this subject received lengthy consideration by the conference.

There was a sharp division of opinion regarding the form of organization. Several projects were convinced that the irrigation district form of government was feasible and satisfactory, and these projects expressed themselves as ready to take over the project management under the district irrigation laws of their respective States. Other projects declared that because of peculiarities of the district laws of their States, or because of local conditions which could not well be changed, the irrigation district form of government seemed infeasible and well-nigh impossible. These latter projects proposed an association form of government, the association to be a corporation under State law, recognizing the joint liability of the water users and proposing ample security to cover the obligations due the Government. The conference finally decided that in its opinion the form of project management should be left optional with the projects, but remained silent as to the principle of joint liability. Undoubtedly, the discussions of the conference indicated that the water users are eager to take over the management of the projects and are ready to cooperate with the Government to the fullest extent in working out contracts that will fully protect the Government and at the same time give the water users the greatest opportunity to manage the projects successfully.

Subsection I provides that when the water users take over the care, operation, and maintenance of a project the total accumulated net profits of various kinds

shall be credited to the construction account of the project. In this connection the question was raised as to the possibility, after a contract for management had been entered into with the Government, of using the annual revenues to meet the annual construction and operation and maintenance charges. It was the unanimous opinion that the law could be so construed as to make this possible, and that since on many projects there is a considerable income from power plants, grazing lands, etc., this plan, might be of considerable assistance in achieving project success.

Subsection K also was given extended and constructive discussion. This subsection provides that the Secretary of the Interior shall have authority to undertake a comprehensive and detailed survey of the projects for the purpose of determining whether the inability of settlers to repay construction costs is due to lack of soil fertility, inadequate water supply, other physical causes, or errors or mistakes and that upon the basis of such surveys and report to Congress, authority may be obtained for charging off certain amounts now included in the construction costs to be repaid by the water users. It was agreed by all the speakers that in the classification of project lands the last class might well be the one that should either be charged off permanently as not within the possibility of reclamation or held in suspension until such time as new methods of agriculture or remedial measures had brought the lands in question within the possibility of reclamation. With respect to the question of inadequate water supply, a number of definitions of an adequate water supply were offered by the delegates. All of these were interesting, many of them novel, and some of them contributions to the terminology of irrigation practice. It would seem to be the general opinion that whenever a crop received so much water that it did not appear to the eye of the experienced farmer to be suffering for water, it was receiving an adequate supply. Others, however, voiced the opinion that a water supply is adequate only when it permits a maximum production of crops, even though the increase in yield be slight as compared with the large volume of water necessary. Meanwhile it was agreed that, except on a few projects, water shortage is not a disturbing factor in Federal reclamation.

The probable errors or mistakes that may have been made in the construction, operation, and maintenance of the projects were not discussed, as it seemed to the conference that such matters vary with the different projects and can best be dealt with when the appraisal committees

visit the projects. It was urged that the surveys contemplated in subsection K be undertaken without delay, that reports based upon them be transmitted to Congress at the earliest possible date, and that prompt steps be taken to obtain congressional action on them. In fact, several speakers gave it as their opinion that little could be done to take over the projects by the water users, and therefore to secure the benefits of the new repayment law, until after these surveys had been made, reported to, and acted upon by Congress.

### RESULTING RESOLUTIONS

The resolutions as formulated by the official delegates from the projects include, in essence, the views of the delegates relative to the operation of the new law.

At a meeting of the reclamation representatives Thursday afternoon a splendid spirit of cooperation with the Federal Government officials was shown, and confidence expressed in the final working out of the relief measures by the Secretary of the Interior that will place irrigation projects in a more prosperous condition and assure to the water users that our Federal Government recognizes the co-partnership that really exists. The following representatives were named on the resolution committee:

W. L. Barker, Yakima project, Washington.

W. D. Buchholz, Belle Fourche project, South Dakota.

James T. Whitehead, North Platte project, Nebraska-Wyoming.

Karl F. Keeler, Strawberry Valley project, Utah.

L. J. Magee, Boise project, Idaho.

Roland Harwell, Rio Grande project, Texas.

Charles Moynihan, Uncompahgre project, Colorado.

Lee R. Taylor, president of the Federated Water Users Association, presided at the night meeting, and all resolutions presented by the committee were unanimously adopted.

W. L. Barker, president of the Sunnyside Valley irrigation district, Yakima, Wash., was chairman of the resolution committee and Charles Moynihan, of the Uncompahgre project, was secretary.

General expression was voiced toward Governor Campbell, Governor Davis, Dr. John A. Widtsoe, and Director G. C. Kreutzer for the able, fair, and helpful manner in which the conference was conducted. The resolutions follow:

*Whereas* very unfavorable financial conditions exist on many of the irrigation projects constructed by the United States, and to relieve these conditions and to

place them on a more substantial basis the Hon. Hubert Work, the Secretary of the Interior, appointed the Fact Finding Commission and subsequently appointed from this commission Hon. Elwood Mead as Commissioner of Reclamation;

*Whereas* conditions on these projects are such that it is imperative that they obtain all the relief provided by the fact finders' bill, which became a Federal law on December 5, 1924, without unreasonable delay, and the Secretary of the Interior realizing these conditions and the necessity for quick action has now proposed appraisal committees represented by Governor Campbell and Doctor Widtsoe, who are now in session in this city to aid the several projects in applying the terms of said relief law: Therefore, be it

*Resolved*, That we, the representatives of the projects assembled in the city of Denver, Colo., do hereby express our sincere appreciation to Secretary Work, to Commissioner Mead, and to the members of the Fact Finding Commission for their efforts in our behalf, realizing that they have made the fact finders' relief bill possible, and that we are willing to support and cooperate with the Secretary of the Interior to the fullest extent in his efforts to bring about more favorable conditions on the projects;

That each project be allowed to make its own choice as between a water users' association and irrigation district;

That in the event the water users elect to take over maintenance and operation of a project as a precedent to securing the benefits of the act of reclamation of December 5 the water users be granted the privilege of accepting any desired benefits to the exclusion of all other benefits;

That subsection G of the adjustment act should be modified by new legislation to the end that, on projects where the physical conditions of the irrigation works are such that there is reasonable apprehension as to their permanence and where there is reason to believe that further heavy construction expenditure will be necessary, the taking over of the operation and maintenance be not required as a precedent to receiving the benefits of this act;

That the scope of the review board in connection with the adjustment act should be broadened to include the investigation of serious physical factors in the future success of the projects, and the making of recommendations thereon as to remedial action that may be found advisable;

That in determining the per acre value of crops an appraisal board be appointed on each project or division of a project. The appraisal board shall consist of three members to be appointed by the water users' organization and two members to be appointed by the Reclamation Bureau. This board shall adopt rules for fixing values and determining the yield of the different crops, which rules shall be approved by the Secretary of the Interior;

That we believe the adjustment act of December 5, 1924, provides for individual acreage liability, and that when the construction charge on the given acre is fixed by the Secretary of the Interior and thereafter fully paid such acre shall be released from further liability for project construction charge. In this connection we respectfully call attention to the original

(Continued on page 28)

## THE DENVER CONFERENCE

(Continued from page 27)

wording of H. R. 8836, page 6, line 21, as submitted by the Fact Finding Commission, for comparison with the wording in subsection F of the act as amended and passed by Congress; also that a similar comparison be made between the language of line 19, page 9, of H. R. 8836, and the language of subsection L of the act as passed;

That in administrating the act of December 5, 1924, we respectfully request that it be interpreted and construed most liberally and favorably to the settlers under reclamation projects, to the end that they may be placed in a position to make their project payments without need of further adjustment, and that all benefits thereunder be extended equally to water users' associations or irrigation districts;

That where legal water users' organizations are ready and desirous of taking over the care, operation, and maintenance of project works the same be transferred to them at once, so that they may assume control for the season of 1925;

That we respectfully invite this Adjustment Commission to visit each reclamation project at its earliest convenience;

That in our opinion it should be the policy of the Reclamation Bureau to grant a three-year moratorium on construction cost payments upon application and proper showing by any reclamation project;

That all delinquent charges and penalties existing at the time of the execution of any amended contract be added in each case to the total obligation of the water users, and the new total thus established then be the construction charge against the land in question;

That the lands of each project be classified in substantial accordance with the pattern rules, a copy of which is attached hereto. For this purpose there shall be appointed a classification board of five members, three of whom shall be appointed by the irrigation districts or water users' associations, and two members by the Bureau of Reclamation. This board shall employ one or more competent persons to do the classifying of the lands of the project under their direction;

That past crop returns be subject to review and modification;

That future crop returns be taken and prices fixed according to rules to be agreed upon by water users of each project, and the Secretary of the Interior.

Whereas entrymen on Government irrigation projects are not required to make proof of reclamation and qualify for patent at time of making proof of residence and cultivation, and under some project conditions for many years thereafter; and

Whereas on such projects, district organizations making assessments find in such cases enforcement of same impossible, and

Whereas the Government has a guarantee of repayments from the districts under contracts without withholding patents: Now therefore be it

*Resolved*, That we recommend that the Federal laws be amended to require issuance of patents after proof of residence and cultivation on projects having contracts for repayments: Be it further

*Resolved*, That it is the sense of this meeting that the regulations which are to be prescribed by the Secretary of the Interior relating to the supervision of projects, the control of which has been tendered to the water users under the act of December 5, be along the general lines of those set forth in the contract between the United States and the Salt River Valley Water Users' Association, to the end that the water users may manage their affairs in a business-like manner without further restrictions than those imposed in this tried contract, where the success of the operation thereunder has been demonstrated, and that the charges incident to this supervision be limited to the cost of the actual services rendered and be not based upon a flat charge or a percentage of the construction cost.

W. L. BARKER, *Chairman*,  
ROLAND HARWELL,  
W. D. BUCHHOLZ,  
JAMES T. WHITEHEAD,  
KARL F. KEELER,  
L. J. MAGEE,

CHARLES MOYNIHAN, *Secretary*,  
*Resolution Committee.*

### ADJUSTMENT ADVISERS COME TO WASHINGTON

*Following the conference in Denver of project representatives, covered in detail in another part of this issue. Gov. Thomas E. Campbell and Dr. John A. Widtsoe, adjustment advisers of the southern and northern divisions, respectively, constituted chairmen of the Board of Survey and Adjustments; George C. Kreutzer, director of reclamation economics; Andrew Weiss, assistant director of reclamation economics; and B. E. Stoutemyer, district counsel, came to the Washington office to discuss with Commissioner Mead the organization of the project reappraisal work and other matters in connection with the interpretation and application of the new reclamation law.*

American agriculture is in the best position it has held since 1920. Prices of many crops are at the highest point in four years, and costs of production have declined from the high point of the depression period.

The success of cooperative marketing depends more than anything else upon efficient management and a thorough understanding on the part of the membership as to the possibilities and limitations of cooperative marketing.

### RELIEF TO SETTLERS MUST BE SAFEGUARDED

The Bureau of Reclamation is not a credit agency, like the War Finance Corporation, or the Federal Land Bank, and it would appear that these are the sources that settlers should look to for the refunding of pressing private obligations and for obtaining money on longer time and more favorable interest rates. Any attempt to have the Bureau of Reclamation function as such a credit agency, and to sanction the postponement of payments for its services in order that the principal and interest of other debts might be paid, will hopelessly demoralize its finances and so discredit its operation as to endanger the whole reclamation policy. There is imminent danger of this, and adjustments should, therefore, be restricted to the sphere in which relief can legally be extended, and where conditions on the projects justify such extension.

There is no authority under the relief act of May 9, 1924, to grant extension of operation and maintenance charges for 1924, and the moratorium of three years authorized by subsection F of the fact finders' law is contingent upon operation and maintenance of constructed works being taken over by the water users according to the provisions of subsection G of this law. From this it follows that there can be no general moratorium under the present law until there are executed appropriate contracts for adjustment, which can only be made properly and safely after comprehensive surveys have been completed and essential data assembled and studied by the board which will visit the projects for this purpose.

### BOX OF YAKIMA APPLES BRINGS GROWER \$1.18

A box of extra fancy Winesap apples produced in Washington State and sold for \$5 by a grocery store owned by an individual in New York City, returned a gross profit of \$1.18 to the grower and \$1.87 to the retailer. It was assumed that the apples were shipped by a producer-owned organization and reached the consumer through a wholesaler, jobber, and retailer. The grower's gross profit represented 23.6 per cent of the retail price and the retailer's share was 37.4 per cent. The jobber operated on a 49-cent margin per box and the wholesaler 39 cents, or 9.8 per cent and 7.8 per cent respectively. The transportation charges were 80 cents, or 16 per cent, and the margin of the shipping organization was 27 cents, or 5.4 per cent.



## COMPLETENESS OF EFFORT

THE caption to this article is a phrase with a wealth of meaning, and is the ideal toward which the employees as a unit, of the Bureau of Reclamation should work. Perhaps some of us sometimes do a job of work that on the face of it is satisfactory and will pass close inspection; but does it represent in full the idea contained in the words "completeness of effort?" This idea is exemplified to a high degree in the fine relationship existing between the employees, of the Rio Grande project and the water users, which might well be emulated on other projects of the bureau. The following letters bring out this idea so forcefully that they are quoted with a view to calling to the attention of all the projects, and incidentally the water users, the possibilities that lie in a genuine spirit of completeness of effort and cooperation on the part of all members of the reclamation family.

### THE LETTERS

ELEPHANT BUTTE IRRIGATION  
DISTRICT OF NEW MEXICO,  
Las Cruces, N. M., December 15, 1924.  
Dr. ELWOOD MEAD,  
Commissioner,  
Bureau of Reclamation,  
Washington, D. C.

DEAR DR. MEAD: We have, on several occasions, taken the liberty of writing you on the importance of better relationships between settlers' organizations and bureau officials in furthering the solution of the problem of making reclamation a success. It has been our belief that, in the history of this project, this factor has been of perhaps equal importance to the factors of strikingly high grade engineering and excellent organization of the project forces.

We believe in centralized authority under an engineering head, and have suggested to you as a possible progressive step in the bettering of conditions on the more backward projects, the introduction of methods calculated to secure better relationships. The theoretical value of such policies, we believe, is unquestioned, but the details of putting them into operation under particular circumstances are, no doubt, quite baffling. It has been our experience that direct contacts formed by project managers, although extremely valuable in arousing community leaders to their responsibilities in regard to this relationship, bring results but slowly because no leaders can advance much ahead of the great force of public opinion, which, on reclamation projects is influenced to a very great degree by the particular contacts that the individual farmers have with various field men of the service.

The recognition of this situation by our local project office, and the appropriate

handling of it, explain partially the local success.

I am enclosing herewith copies of recent letters which have passed between the district and the project office, which throw some light on detailed methods of gaining this elusive better relationship. The particular significance of incidents such as are referred to lies in their proven effectiveness under our local conditions.

Feeling that you might be interested in these trivial indications of the water users' attitude, and that you might appreciate the receipt of occasional letters of favorable comment, we are

Very truly yours,

ELEPHANT BUTTE IRRIGATION  
DISTRICT.

J. W. TAYLOR,  
President and Manager.

EL PASO, TEX., December 11, 1924.  
From: Superintendent.  
To: Assistant Engineers Bushman,  
Brown, and Kerr.  
Subject: Construction results—Rio  
Grande project.

1. Construction work yet remaining to be accomplished in the Rincon, Mesilla, and El Paso Valleys is largely extensions to the lateral and drainage systems. Practically all of the large principal structures and works have been completed. The building of the smaller works, consisting of small canals and structures and setting of farms turnouts is a subject of probably more intimate interest to the land owner than the more remote principal structures. These smaller structures and distributaries directly affect the land owner's farm layout and his operations.

2. This class of work calls for direct contact between the employees of the Bureau of Reclamation and the water users, and the service rendered forms, to a large extent, the basis of the opinion of the entire operations of the bureau.

3. From personal inspection, cost reports, and information reaching the

### COOPERATION BY ALL WILL BRING SUCCESS

In a recent statement Mr. Joseph W. Taylor, president and manager of the Elephant Butte Irrigation District, Rio Grande project, said:

"We have been closely watching the trend of Federal reclamation since the creation of the office of commissioner and the appointment of Doctor Mead. We are forced to the conclusion that progress is slowly and surely being made, and it is our belief that acknowledgment of this situation should be made by displaying a spirit of cooperation and confidence."

project office concerning the project work, I am much gratified at the character of results which are now being obtained by you in accomplishing the construction program.

4. It has been noted that the policy so desired by the project office of completeness of effort has been well carried out. I have been assured by many of the land owners whose property has been affected by recent canal and other work that they appreciate the fine spirit of cooperation, the effectiveness of the work, and its reasonable cost.

5. I am writing this to you to express my appreciation and acknowledgment of your efforts to not only produce effective works at low cost, but to effect a feeling of satisfaction on the part of the land owners who are paying the bill that the work has been well done and has taken his interest into consideration. The work of the construction force now furnishes an answer to the question of "How can these works which benefit the water users be built without antagonizing them?"

L. M. LAWSON.

DECEMBER 15, 1924.

L. M. LAWSON,  
Superintendent, Bureau of Reclamation,  
El Paso, Tex.

DEAR MR. LAWSON: It was a great pleasure to receive a copy of your letter of December 11 to Assistant Engineers Bushman, Brown, and Kerr on the subject of the construction results of the Rio Grande project, and to note the emphasis you placed therein on the fine spirit of cooperation which your force has exhibited during the past year.

You have very properly called their attention to the fact that this spirit has been generally noted by water users, and this office desires to express appreciation of your remarks. Not a week goes by that we do not hear favorable comment on your engineering staff, and it is quite noticeable that the number of criticisms and complaints is steadily diminishing. The true effect of this general appreciation of the bureau's services is quite apparent on the amount of work required by this office in investigating complaints.

The indirect effect we feel is of even greater value to us in that there is a growing feeling of the mutuality of the responsibility for success or failure of reclamation that is being properly shared between the bureau and the settlers. We are thus overcoming one of the most baffling problems of reclamation, that of learning to operate successfully and at the same time preparing the settlers' organizations to take over the projects under conditions of effective operation, with an awakened public opinion, believing that local self-government of the people, for the people, and by the people is an assured success. We have for a long time realized that this was your goal. Its practical accomplishment speaks volumes for you and your loyal and efficient employees, and should point the way wherein the less fortunate projects may find success.

Cordially yours,

ELEPHANT BUTTE IRRIGATION  
DISTRICT.

J. W. TAYLOR,  
President and Manager.

# THE GUERNSEY DAM ON THE NORTH PLATTE PROJECT

*Andrew Weiss, superintendent of the project, describes the proposed dam and its relation to the water supply and power requirements of the project*

THE Guernsey Dam is one of the features of the North Platte project, Nebraska-Wyoming, which has been under consideration for more than 20 years. It was one of the important items investigated at the initiation of the North Platte project in 1903 in connection with the Goshen Hole Division of this project. Then it was intended to function as a diversion dam for the so-called Highline Canal which it was proposed should divert from the North Platte River in The Narrows about 1 mile above the town of Guernsey.

In 1910 the Board of Army Engineers made a careful study of the possible project extensions, particularly with reference to further development on the south side of the river. Preliminary surveys were under way at the time this board made its inspection trip and after carefully viewing the topography and soil conditions, the location of the canal, and the various construction features connected therewith, the board recommended strongly that the Fort Laramie Division should be given preference to the proposed Highline Canal in point of time. The question of the sufficiency of the water supply for this Highline Division was also a serious desideratum, and it was recommended that this feature be given further study and determination before undertaking the construction of the Fort Laramie Division.

Altogether, the reasons were compelling for the postponement of the Guernsey Dam at that time. In later years, it developed that the diversion duty on the Interstate Canal was such as to cause apprehension and it was decided that the building of the Guernsey Dam as a storage feature presented a problem that would have to be met sooner or later. In addition, there are as yet a number of private canals which are not protected by any supplemental storage and the time may arrive when it will be necessary to provide for these to avoid shortage and crop losses.

It is also known that there occurs occasionally a succession of short run-off years when the storage will be entirely depleted and consequent shortages and crop losses may result. At any rate, the provision for further storage appears to be a needful measure to take care of such contingencies as will doubtless arise in the future in connection with the further development of the irrigation interests in the valley.

Primarily the Guernsey Dam is a storage feature. For this purpose, it is strategically located in a narrow canyon

## ANCIENT ROMAN WRITER DEFINES AN ENGINEER

*We are indebted to the Journal of Electricity for the following definition of an engineer, written by Marcus Vitruvius, who lived about 150 B. C.:*

*"He should be a good writer; a skillful draftsman; first in geometry and optics, expert at figures; acquainted with history; informed on the principles of natural and moral philosophy; somewhat of a musician; not ignorant of the sciences, both law and physics; nor of the motions, laws, and relations to each other of the Heavenly bodies.*

*"A normal philosophy will teach him to be above meanness in his dealings and to avoid arrogance. It will make him just, compliant, and faithful to his employer, and, what is of greatest importance, it will prevent arrogance gaining an ascendancy over him; for he should not be occupied by thoughts of filling his coffers, nor with the desire of grasping everything in the shape of gain, but by the gravity of his manners and a good character should be careful to preserve his dignity."*

about two miles above the town of Guernsey. At this point and for some distance up and down the stream the river is about 250 feet wide at the low water line. A number of promising dam sites were investigated by borings and the most suitable one was found at this location. The dam is planned to be about 100 feet in height measured from the present river bottom. Only rough preliminary designs have so far been made so that it is premature to outline any definite description of this structure. Tentative plans so far considered contemplate the building of either an earth fill or part earth and part rock fill dam, 20 feet top width, upstream slope 3 to 1 and downstream slope 2 to 1. Both the upstream face as well as the downstream toe will be well protected by rock riprap and paving to insure safety against destructive wave action and backwash. Type and size of spillway have not been definitely decided upon, but the Bureau of Reclamation has in mind the necessity of making specially ample provisions here to take care of such floods as may be experienced

from a combination of the most adverse conditions. This might happen when both reservoirs might be filled to overflowing and at the same time a cloudburst spread over the portion of the catchment basin below Pathfinder, which might be further swelled by heavy snowfall run-off from the upper reaches of the stream. It has been estimated that such a combination might possibly result in a total overflow of approximately 100,000 second-feet.

The storage capacity of this reservoir is estimated at about 70,000 acre-feet. This represents only a part of the annual savings that may be effected by this reservoir because of its strategic location which enables it to serve as an equalizing reservoir and, as such, it may be filled twice or more in any year depending upon seasonal conditions.

In connection with the storage feature, it has always been planned to develop such power facilities as the situation may offer and justify. No definite figures can be given at this writing concerning the size of this power installation more than to state, that it is planned to supply the neighboring towns of Guernsey, Wheatland, Fort Laramie, as well as Hartville and Sunrise, and the C. F. & I. Co. works at the latter place. Power service has also been furnished for the past three years to the several valley towns east of Lingle, Wyo., down to and including Mitchell, Nebr. It is proposed to interconnect this plant with the Lingle plant of the Bureau of Reclamation, whereby suitable exchange service may be established and the efficiency of both plants thereby greatly increased. For example, the water passing the Guernsey Dam through the entire summer season will carry whatever load may be developed in the vicinity of both the Lingle and Guernsey plants, thereby making it unnecessary during such part of the year to draw upon the Lingle plant, thereby utilizing the entire canal flow for irrigation during such period. Conversely, during the winter months when the flow is necessarily low, both plants may be operated and thereby their combined capacity may be utilized to whatever extent may be necessary to supply the existing market.

The necessary right of way for this reservoir was purchased during the summer of 1922, at a cost of approximately \$100,000. The Second Deficiency Act, approved December 5, 1924, carries an appropriation of \$800,000 "for continued investigations, commencement of construction of the Guernsey Reservoir, and incidental operations."



## SOUTH AFRICAN REPAYMENT AND SETTLEMENT PROBLEMS

*A. D. Lewis, director of irrigation of the Union of South Africa, discusses in annual report the problems of South African irrigation development and how they can best be met*

THE following extracts are from the introduction to the annual report of the director of irrigation of the Union of South Africa for the financial year ended March 31, 1923.

Legislation was introduced during the session of 1922 to make it possible to lessen the repayment charges on irrigation loans during the early years after the completion of new irrigation schemes. Section 6 of act 38 of 1922 reads as follows:

6. *Modifications of redemption provisions for irrigation loans.*—Notwithstanding anything contained in section one hundred and twenty-five of act No. 8 of 1912 as amended by act No. 26 of 1916, the Minister (as defined in the first-mentioned act) may, whenever special circumstances (such as failure of water supply, damage to crops, depression of markets or excessive costs during development) have made difficult the annual payment of sums under that section to redeem an irrigation loan, reduce, at the request of the borrower, those payments over a period not exceeding four years.

*Provided that,* At the end of that period, the aggregate amount of the reductions, together with interest thereon, is added to the amount of the loan for purposes of redemption, and the periodical payment required to redeem the loan is raised accordingly until the loan is entirely redeemed.

Acting on this, very considerable reductions were made for a number of boards, but I regret to have to report that even the reduced payments have in most cases not been made.

In view of the fact that the reductions were very great, I repeatedly urged that action should be taken under section 126 of the act, under which section the Minister of Finance can do what the boards have failed to do—namely, sue those who have not paid their rates; but no action has yet been taken. I must repeat what I stated in paragraph 6 of my report for 1920-21 that unless the irrigation rates, which are a first claim in case of insolvency, are rigidly collected, the financial credit of people in an irrigation district will fall low in the estimation of money-lending institutions, and the consequences will be disastrous.

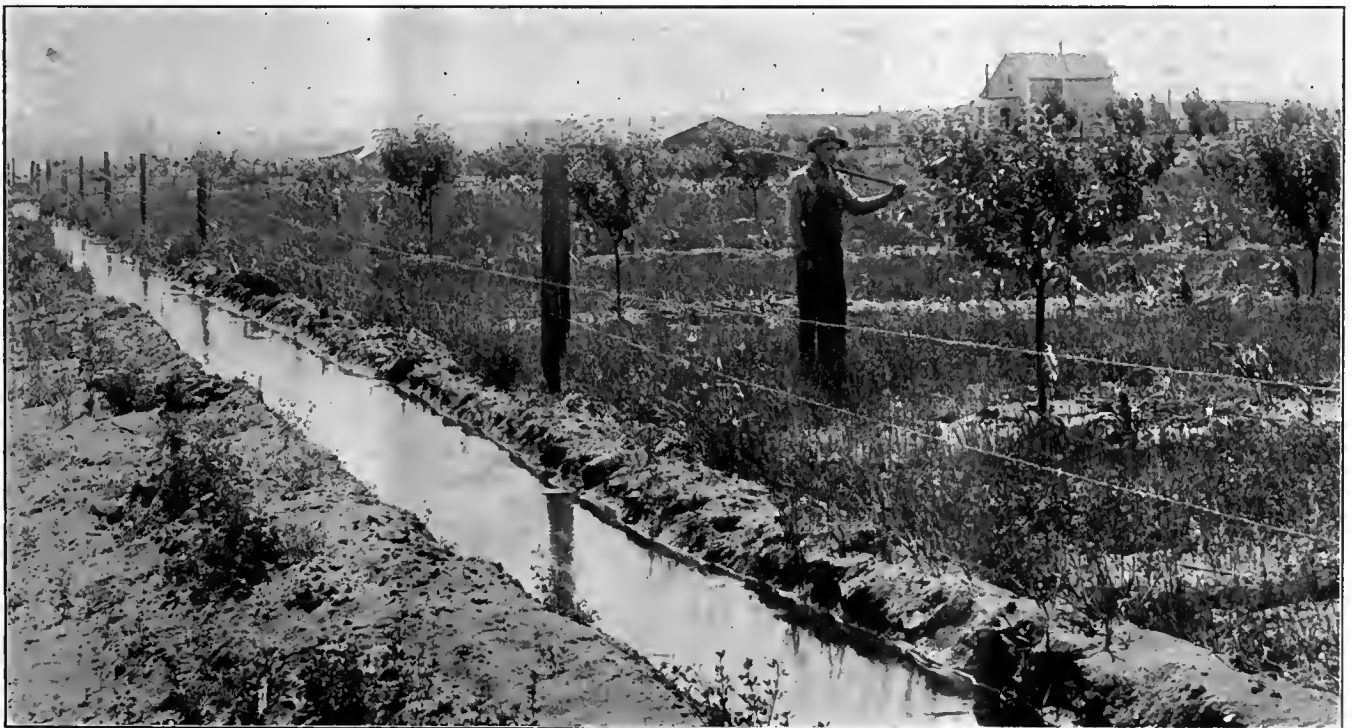
While the act stands as it does, it is my clear duty to recommend that the stern action provided should be taken to collect the rates. The board should perform this duty, but it frequently happens that the biggest defaulters are members of the board, who are naturally not inclined to do it, and the unpleasant duty must in many cases fall on Government. The severity of enforcing the payment of rates could be tempered if Government

would take over surplus land at a fair price in lieu of rates; but this department had no powers or organization to deal with the purchase and settlement of land, and some proper machinery and organization must be evolved to deal with them.

I do not think the situation with regard to existing schemes should be considered apart from the problem of providing against a similar situation in future schemes. It would be fatal, especially in view of the present depressing world conditions, to rush into a panicky treatment. Irrigation development should go on steadily, and a sudden stoppage would not only lessen confidence in it, but would necessitate a disbandment of plant and staff acquired for the special purpose. The staff, for example, at present contains a large number of young South African graduates, to whom great attention has been given to train them in the special work, and it would be a pity to dispense with them just when they have become very valuable to the country.

Are the future schemes, then, to be carried out in the same way as in the past—i. e., by loans to boards with no special provision for rapid development and settlement, which are the essentials for success, and leaving large areas in the hands of the original owners with unlimited powers of speculation?

(Continued on page 32)



A four-year-old fruit orchard on the Umatilla project, Oreg.

## SOUTH AFRICAN PROBLEMS

(Continued from page 31)

Although realizing all the disadvantages of State as compared with private activity, there is one class of scheme for which I have no hesitation in saying that the present board system should be abolished and the State should take far more active steps in land and settlement matters from the outset and that is in the case of large storage schemes for undeveloped areas.

Without disparaging the diversion schemes or the small storage schemes, which are essential to this country, and without enlarging on the reasons, which are somewhat technical, it can be safely asserted that without the large storage schemes we will never be able to make anything like full use of the available water of this country. From a national point of view the big storage schemes must be encouraged and carried out. But under a big storage scheme the whole nature of agriculture is changed. Intensive cultivation is required, and where one owner farmed before the scheme 100 farmers may be necessary when the scheme is completed. The business of causing this great change, of rapidly multiplying the number of settlers, is quite beyond the powers of a board of farm owners, and even the business of constructing such big storage dams is work for which they are not fitted. In such cases, then, I think the board method should not be adopted, and the State should handle the whole business of construction and land settlement from the outset.

The desirability of handing over the whole management of the scheme eventually to a private board should not be lost sight of, but at the outset the business of investigation, acquiring land, dividing it up, getting suitable settlers, financing and advising them, constructing and maintaining the scheme, and collecting rates should be undertaken by the State.

In my opinion a single organization should deal with all these matters, as it is likely to be a more efficient arrangement than a large number of separate departments dealing with them. The program of settlement should be closely linked up with the program of construction, and numerous activities should be coordinated. To take only the one matter of finance: The lands department, the land bank, and the irrigation department all make separate advances in the same irrigation scheme with separate provisions in parliamentary votes and separate arrangements for collecting repayments. In other countries where this problem has arisen, multiple control has been abolished in favor of single control, generally with some form of Government board with wide powers at the head.

The advantage of such a board is that a steady program can be planned in advance to meet fairly the needs of the country, and investigation can then be thoroughly made, especially into the land and settlement matters, before construction is rushed ahead by pressure from interested persons.

If some such organization is necessary for future schemes, should it not be created early to deal with the existing schemes also, especially with the urgent problem of acquiring surplus land and settling it on sound lines? On future big storage schemes the settlement of the surplus land should be considered at the outset of the scheme and should not be left till it is found that the rates are not being paid. If the present irrigation board method of starting a scheme is adhered to, some method of acquiring the surplus land before a loan is granted would have to be adopted. It is questionable, however, whether, if the prospect of big profits on the sale of land is removed when this policy is adopted, there will be sufficient incentive left to private owners in undeveloped areas to initiate the big storage schemes which are a national necessity. It will probably be necessary to abandon the irrigation board method at the outset and devise some means of favorably acquiring the land for the State, and if we can go as far as this we should also, in view of the national importance

## MILK RIVER PROJECT GETS IDAHO FAMILIES

Options on the Hieronymous ranch and adjoining tracts of land west of Glasgow have been taken by K. L. Molen, agricultural development agent of the Great Northern Railway, assisted by Secretary Rugg of the Glasgow Chamber of Commerce. This is the initial step toward colonizing the Milk River Valley of that city.

Twenty Idaho settlers and their families arrived in Glasgow recently. It is the plan of the development department of the Great Northern to parcel the land out to the colonists in farm units from 80 to 160 acres where possible.

of such schemes, reduce the rate of interest on money spent on them and provide for specially favorable consideration of water rights.

I have written at length on this subject because the two most pressing matters requiring attention to-day are the non-payment of rates on existing schemes and the urgency of preparing for new schemes on sound lines, so that we may not be rushed into them hurriedly when the works now under construction are completed.

At the root of both matters is the urgent problem of the proper settlement of the irrigated areas, and I think it should be decided early how far the State will actively participate and by means of what organization.



The King Hill project, Idaho, is one of the favored spots for the lowly spud

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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E. C. Finney, First Assistant Secretary; F. M. Goodwin, Assistant Secretary;

John H. Edwards, Solicitor for the Interior Department; E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary;  
John Harvey, Chief Clerk

Washington, D. C.

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W. F. Kubach, Chief Accountant

C. N. McCulloch, Acting Chief Clerk

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R. M. Patrick and Armand Offutt, District Counsel.

Board of Survey and Adjustments

Thomas E. Campbell, Chairman Southern Division

John A. Widsøe, Chairman Northern Division

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....		Brooks Fullerton.....	Mitchell, Nebr.
Boise.....	Boise, Idaho.....	J. B. Bond.....	E. R. Mills.....	C. F. Weinkauff.....	B. E. Stoutemyer.....	Boise, Idaho.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	V. L. Minter.....	V. L. Minter.....	Ottamar Hamel <sup>1</sup> .....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	S. O. Harper.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	A. R. McGinness.....	J. P. Siebeneicher.....	Miss M. C. Simek.....	E. E. Roddis.....	Billings, Mont.
King Hill.....	King Hill, Idaho.....	G. H. Harris.....	E. V. Hillius.....	E. V. Hillius.....	B. E. Stoutemyer.....	Boise, Idaho.
Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	G. R. Barnhart.....	H. L. Holgate.....	Portland, Oreg.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....		E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	G. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	E. J. Coffey.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	H. W. Bashore.....	L. H. Mong.....	V. E. Hnbell.....	Brooks Fullerton.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	E. J. Coffey.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	Ottamar Hamel <sup>1</sup> .....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	Henry Berryhill.....	Brooks Fullerton.....	Mitchell, Nebr.
Salt River <sup>2</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>3</sup> .....				
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	W. C. Berger.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	G. C. Patterson.....	C. M. Voyer.....	H. L. Holgate.....	Portland, Oreg.
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Williston.....	Williston, N. Dak.....	W. S. Arthur.....	W. S. Arthur.....	H. C. Melaas.....	E. E. Roddis.....	Billings, Mont.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	C. A. Denman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls.....	American Falls, Idaho.....	F. A. Banks <sup>4</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
Umatilla, McKay Dam.....	McKay Dam, Oreg.....	R. M. Conner <sup>5</sup> .....	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.
Yakima, Tieton Dam.....	Rimrock, Wash.....	Walter Ward <sup>4</sup> .....	M. J. Gorman.....	C. F. Williams.....	do.....	Do.

<sup>1</sup> Attorney.

<sup>2</sup> General Superintendent and Chief Engineer.

<sup>3</sup> Superintendent of Construction.

<sup>4</sup> Project operated by Salt River Valley Water Users' Association.

<sup>5</sup> Construction Engineer

The NEW RECLAMATION ERA is issued every month by the Bureau of Reclamation of the Department of the Interior, Washington, D. C. It is printed by the Government Printing Office, Washington, D. C.

The NEW RECLAMATION ERA is sent regularly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents per year, payable in advance. Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C., and remittance in the form of postal money order or New York draft should be made payable to the Special Fiscal Agent. Postage stamps are not acceptable in payment of subscription.

—COOPERATION

*NOT a month goes by but this office receives new evidence that there is a true desire on the part of the present Bureau of Reclamation organization to acquaint itself with the settlers' problems, with a view to the establishment of policies directed toward expediting the success of reclamation. The development of new policies since Doctor Mead has been in office unquestionably will go a long way toward allaying the hostile spirit which has been shown on many projects toward bureau policies, and we believe there is being developed a cooperative spirit between the settlers and the bureau that will do much toward making Federal reclamation successful.*

*J. W. TAYLOR, President and Manager,  
Elephant Butte Irrigation District,  
Rio Grande Project, New Mexico-Texas.*

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# NEW RECLAMATION ERA

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MARCH, 1925

NO. 3



MAKING FURROWS PREPARATORY TO IRRIGATION



*IT was Secretary Work who appointed the Fact Finding Commission, and it was the Fact Finding Commission that was responsible in a large measure for the present relief law. It was Secretary Work who appointed the present able Commissioner of Reclamation, Honorable Elwood Mead, who was one of the Fact Finders.*

*It is our opinion that these men, and the local reclamation officials are working honestly and earnestly to put this new law into effect in order that the Government may be protected in the future and that the Government water user on all projects will get all that is justly due him.*

*G. A. REMINGTON,  
Manager Nampa & Meridian Irrigation District,  
Nampa, Idaho.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

MARCH, 1925

No. 3

## THE BOARD OF SURVEY AND ADJUSTMENTS

*Organization of the board and of the local cooperative committees which will work in conjunction with the board in the classification of project lands and the adjustment of differences between the water users and the Government*

SUBSECTION K of the fact finders bill provides, in part, that "on each existing project where, in the opinion of the Secretary, it appears that on account of lack of fertility in the soil, an inadequate water supply or other physical causes, settlers are unable to pay construction costs, or whenever it appears that the cost of any reclamation project by reason of error or mistake or for any cause has been apportioned or charged upon a smaller area of land than the total area of land under said project, the Secretary is authorized to undertake a comprehensive and detailed survey to ascertain all pertinent facts, and report in each case the result of such survey to the Congress with this recommendation."

One of the first steps taken by Secretary Work to put this provision of the law into effect was the appointment of a Board of Survey and Adjustments to classify the lands on the projects and adjust differences between the water users and the Bureau of Reclamation. Hon. Thomas E. Campbell, former Governor of Arizona, and Dr. John A. Widsøe, former president of the Agricultural College of Utah, and both members of the Secretary's Fact-Finding Commission, were accordingly appointed adjustment advisers, and each designated chairman of the Board of Survey and Adjustments, which usually will function as two boards, one for the northern projects and one for the southern projects.

The other members of the board will be a representative of the State interested, appointed by the governor of the State, and a representative of the Bureau of Reclamation, appointed by the commissioner. When sitting as two boards, with Governor Campbell acting as chairman of one, and Dr. Widsøe as chairman of the other, the additional members of each will be the State and the bureau representatives, making two boards of three members each.

These boards will be assisted by two soil experts, soil assistants for short

periods, occasional expert assistance for brief periods, chiefly from State colleges, and such stenographic help as may be needed.

In addition, the boards will receive direct and material assistance from the local cooperative committee on each project, composed usually of two water users and the superintendent, or of one water user from each division of the project

and the superintendent. The local cooperative committee has four principal functions, as follows:

1. To secure and supervise a classification of the lands of the project, according to the regulations printed on another page.
2. To state briefly in writing all project matters now in dispute or that now need adjustment.

(Continued on page 34)

### SECRETARY WORK'S INSTRUCTIONS TO BOARD

*The Secretary of the Interior,  
Washington, January 30, 1925.*

*Governor Thomas E. Campbell and Dr. John A. Widsøe,  
Board of Survey and Adjustments, Bureau of Reclamation.*

*Gentlemen: You are authorized to make, under the direction of the Secretary of the Interior, comprehensive and detailed surveys of certain existing reclamation projects that will be hereafter from time to time designated to you by the Secretary for survey. These surveys are to be made under subsection K of the act approved December 5, 1924, entitled—*

*An act making appropriations to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1924, and prior fiscal years, to provide supplemental appropriations for the fiscal year ending June 30, 1925, and for other purposes.*

*and which subsection K reads as follows:*

*That on each existing project where, in the opinion of the Secretary, it appears that on account of lack of fertility in the soil, an inadequate water supply, or other physical causes, settlers are unable to pay construction costs, or whenever it appears that the cost of any reclamation project by reason of error or mistake or for any cause has been apportioned or charged upon a smaller area of land than the total area of land under said project, the Secretary is authorized to undertake a comprehensive and detailed survey to ascertain all pertinent facts, and report in each case the result of such survey to the Congress, with his recommendations: Provided, That the cost and expense of each such survey shall be charged to the appropriation for the project on account of which the same is made, but shall not be charged as a part of the construction or operation and maintenance cost payable by the water users under the project.*

*I direct that these surveys be made with painstaking care and that all factors entering into the work be fully considered and properly weighed so that not only may accuracy be obtained but that confidence in that accuracy may be inspired by the way and manner in which the work is done.*

*It is very important that the greatest expedition consistent with the comprehensive nature of the work you are about to undertake be brought about, so that the benefits of the above referred to act of Congress may be realized by the settlers on the reclamation projects at the earliest possible date.*

*Sincerely yours,  
Hubert Work.*

## OFFICIAL INTERPRETATION OF NEW LEGISLATION

*All water users will be interested in this official interpretation of section 4 of the second deficiency act, comprising many of the recommendations of Secretary Work's Fact-Finding Commission*

FOR the information of readers of the NEW RECLAMATION ERA, we are printing below the official interpretation, approved by the Secretary of the Interior on January 28, 1925, of certain parts of section 4 of the second deficiency act, comprising new reclamation legislation recommended by the Fact-Finding Commission. Other provisions of the act will doubtless require interpretation by the department, and this will be printed in the ERA as soon as available.

### PROVISIONS AND INTERPRETATION

Subsection F provides—

That hereafter all project construction charges shall be made payable in annual installments based on the productive power of the land as provided in this subsection. The installment of the construction charge per irrigable acre payable each year shall be 5 per centum of the average gross annual acre income for the ten calendar years first preceding, or for all years of record if fewer than ten years are available, of the area in cultivation in the division or subdivision thereof of the project in which the land is located as found by the Secretary annually. The decision of the Secretary as to the amount of any such installment shall be conclusive. These annual payments shall continue until the total construction

charge against each unit is paid. The Secretary is authorized upon request to amend any existing contract for a project water right so that it will provide for payment of the construction charges thereunder in accordance with the provisions of this subsection or for the deferment of such construction charges for a period of three years from the approval of this section, or both.

The first sentence of this subsection reading, "That hereafter all project construction charges shall be made payable in annual installments based upon the productive power of the land," applies to all new projects and divisions of projects where the terms of payment have not already been established by contract or accepted water-right applications. Existing contracts can not be modified without the consent of both parties thereto and cases where a modification of existing contracts is necessary in order to apply the new plan of payment are covered by the last sentence of subsection F which provides that—

The Secretary is authorized upon request to amend any existing contract for a project water right so that it will provide for payment of the construction charge thereunder in accordance with the provisions of this subsection or for deferment of such construction charge for

a period of three years from the approval of this section, or both.

This provision vests discretion in the Secretary to amend existing contracts upon request. It is permissive, not mandatory. The words, "upon request" are understood to mean upon request of the other party to the water-right contract in question. The word "contract" itself implies a voluntary agreement and an amendment of an existing contract is a new contract which likewise requires the voluntary assent of both parties thereto. The claim that this provision is mandatory and leaves no discretion in the Secretary of the Interior in applying the new plan of payment when the new plan is requested, is not sustained by the language of the act, which is, "The Secretary is authorized upon request to amend any existing contract," etc. If it had been intended that there should be no discretion on the part of the Secretary, the act would provide, "The Secretary shall upon request amend any existing contract," etc.

Subsection F also provides: "These annual payments shall continue until the total construction charge against each

(Continued on page 35)

## BOARD OF SURVEY AND ADJUSTMENTS

(Continued from page 33)

3. To collect and tabulate all available information relative to settlers' indebtedness, mortgages, delinquent taxes, and any other charges that must be met by the settlers now or in the near future.

4. To collect and classify all crop record data of the past 10 years or the years of record, by classes according to the land classification.

The reports of this committee, exclusive of the internal land classification, are expected to be ready for the consideration of the Board of Survey and Adjustments early in the spring.

The number of water users assigned to the local cooperative committees of the respective projects is tentatively as follows:

*Yuma*.—Two; 1 from the valley and 1 from the reservation district.

*Grand Valley*.—Two; 1 from each of the two districts.

*Uncompahgre*.—Two; from the project as a whole.

*Boise*.—Four; 1 from Black Canyon, 1 from Nampa and Meridian, and 2 from

*Payette-Boise* (1 from each of the two competitive boards).

*King Hill*.—Two; from the project as a whole.

*Minidoka*.—Two; 1 from the Burley and 1 from the Minidoka district.

*Huntley*.—Three; 1 from Pryor, 1 from Eastern, and 1 from Fly Creek division.

*Milk River*.—Three; 1 from the Chinook, 1 from Malta, and 1 from Glasgow division.

*Sun River*.—Two; 1 from Fort Shaw and 1 from Greenfields division.

*Lower Yellowstone*.—Two; 1 from No. 1 and 1 from No. 2 division.

*North Platte*.—Four; 1 from the Interstate, 1 from Fort Laramie, 1 from Northport, and 1 from Goshen district.

*Newlands*.—Two; 1 from each of the two divisions.

*Carlsbad*.—Two; representing the whole valley.

*Rio Grande*.—Two; 1 from the Leesburg and 1 from Rio Grande Improvement Co. division.

*Umatilla*.—Two; 1 from the east and 1 from the west division.

*Klamath*.—Three; 1 from each of the three divisions.

*Belle Fourche*.—Two; from the project as a whole.

*Strawberry Valley*.—Two; representing the whole project.

*Okanogan*.—Two; representing the whole project.

*Yakima*.—Two; 1 from the Sunnyside and 1 from the Tieton division.

*Shoshone*.—Two; 1 from the Garland and 1 from the Frannie division.

The purposes of the Board of Survey and Adjustments, appointed by Secretary Work, are defined as follows:

1. In general, to determine conditions on the projects with a view to applying the remedial measures provided in the act of December 5, 1924.

2. In particular, to make the surveys and reports required by subsection K.

3. To make recommendations for contracts and agreements that may secure regular payments for construction and for operation and maintenance.

4. To help promote good feeling among the water users.

unit is paid." Some of the water users on certain projects claim that this provision indicates an intent on the part of Congress to release the guarantees given to the Government by the various irrigation districts and water users' associations and that the Government take a loss whenever any individual farm unit for any reason proves incapable of paying its pro rata share of the project construction cost.

This argument is largely answered by the fact that the authority to amend existing contracts is permissive and not mandatory and if the Secretary is not required to amend existing contracts at all he is certainly not required to do so for the purpose of releasing guarantees given by water users' organizations and throwing a loss on the reclamation fund which the Supreme Court has held it was not intended should occur. The intent underlying the reclamation act is stated by the Supreme Court as follows in the case of *Swigart v. Baker* (229 U. S. 187, 57 L. Ed. 1143).

That fund was the proceeds of public land and was not intended to be diminished for the benefit of any one project, but, without increase by interest and undiminished by local expenses, was again to be used for constructing other works. The cost of surveying those projects which were not developed and the administrative expenses not chargeable to any particular project might not be repaid, but these sums were so small as to be negligible as against the fundamental idea of the bill, that the proceeds of public land as trust fund should be kept intact and again invested and reinvested for constructing new irrigation works.

From time to time as repayment contracts were made with the various irrigation districts and water users' associations, the Secretary of the Interior attempted to carry out the intent of the act and protect the trust fund in question by requiring the water users' organization, whether a district or association, to guarantee the water-right payments of its members or to make lump-sum payments sufficient to cover the annual payments for the entire project or division covered by the district or association. Under this practice the water user has a primary obligation to pay the portion of the cost of the project apportioned to his particular farm unit or specified in his water-right application and a secondary obligation as a member of an irrigation district or water users' association, to pay assessments if necessary to carry out the guarantee given by the association or district. This secondary liability assumed by reason of the guarantee given by the district or association of which the individual is a member, is referred to by the water users of some of the projects as a joint liability and it is contended by some of the water users that the sentence of

subsection F reading "These annual payments shall continue until the total construction charge against each unit is paid," requires the Secretary to release districts and associations from their guarantees or agreements to make lump-sum payments and thereby relieve the individual members of the association or individual landowners of the district as the case may be, from any responsibility except for a portion of the project construction cost as specified in the individual water-right application or apportioned to the land of the individual landowner of the district.

In every large body of land there will be some tracts which, for one reason or another, will be found incapable of paying construction charges and if the guarantee of the district or association which has been given for the purpose of avoiding loss to the fund in such cases should be released, a loss to the fund would occur and it was to prevent such losses that the settlers' organizations were required to guarantee the payments.

A modification of existing contracts for such purpose would be contrary to the intent of the reclamation law as construed by the Supreme Court in the *Swigart v. Baker* case. The general intent of the new act appears to have been to grant more favorable terms of payment for the purpose of enabling the projects to pay out in a longer period of time. Nothing in the new law requires release of district or association guarantees under existing contracts and so far as the releases of guarantees would tend to deplete the fund would be contrary to the general purpose of the reclamation law as construed by the Supreme Court. If it had been the intent of Congress to change the policy of the reclamation law with respect to the return of the fund in full, it is reasonable to expect that Congress would have expressed some such intent in a plain and definite way, particularly in view of the well-known decision of the Supreme Court. But what was done by Congress was merely to vest discretionary power in the Secretary to amend existing contracts.

Another question which has been raised with reference to the construction of subsection F is the question whether the terms of payment provided under this subsection may be allowed to water users or water users' organizations which have contracted for a supplemental water supply under the Warren Act. In most cases the holders of such Warren Act contracts have contracted for a comparatively small additional water supply and would not desire to adopt the new plan of payment for the reason that their annual payments under their present contracts for the limited amount of water which they are re-

ceiving from the Government works, is lower than would be the payments under the new plan of payment based on the average gross acre income; but in cases where the amounts to be paid by such Warren Act water users is comparable to the amounts paid for a full Government water right, the same reason exists for applying the new plan of payment as in the case of the water users who receive their entire water supply from the Government works and there appears to be nothing in subsection F which would prevent the application of the new plan of payment to Warren Act water users in cases where the new plan is desired by the water users and found by the Secretary to be desirable. The language of the last sentence of subsection F is, "The Secretary is authorized, upon request, to amend any existing contract for a project water right so that it will provide for payment of the construction charge thereunder in accordance with the provisions of this subsection." The term, "to amend the contract for a project water right" is understood to be broad enough to apply to any contract for water from the project works, and that any contract for water from the project works, whether a complete water supply or only a partial water supply, may be considered as within the authority granted the Secretary under this subsection.

Another question which has been raised in connection with the interpretation of subsection F is the question whether in cases where the three-year deferment of construction charges is granted under the last sentence of subsection F but the new plan of payment on the basis of average gross acre income is not granted or desired, the three-year deferment of construction charges would result in the four years' construction charges all becoming due at once at the end of the three-year period. Such a construction would lead to impractical results. If settlers have difficulty in meeting annual construction payments as the same come due, obviously, it would not be practical for them to pay four annual construction payments in one year and it would not be presumed that Congress intended such an obviously impractical result. The language of the act applicable to this question is as follows: "Or for the deferment of such construction charges for a period of three years from the approval of this section." The word "such" in the expression "such construction charges" relates back to the construction charge last above mentioned in the act which is as follows: "The Secretary is authorized, upon request, to amend any existing contract for a project water right so that it will provide for payment of the construction charge

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## VARIOUS SUBSECTIONS DISCUSSED AND INTERPRETED

*Control of the projects, operation and maintenance payments, formation of water users' associations and irrigation districts, disposition of net profits, and adjustment of water charges considered*

(Continued from page 35)

thereunder in accordance with the provisions of this subsection. Consequently, the expression "such construction charges," referring back to the term "the construction charge," relates to the entire construction charge in whatever number of installments it may be divided and not merely to three annual installments of the construction charge. Consequently, the effect of this provision is to defer "the construction charge," including all unpaid installments, for a period of three years and not merely to suspend three installments and thereby require four annual installments to be paid in one year. This interpretation avoids the obviously impractical results of requiring four annual payments in one year and also appears to be the natural meaning of the language used in this subsection.

The closing portion of subsection G reads, "and when the water users assume control of the project the operation and maintenance charges for the year then current shall be covered into the construction account to be repaid as part of the construction repayments." The words "charges for the year then current" mean those made for the year in which the operation and maintenance is assumed by the water users. Thus, if operation and maintenance is turned over during the year 1925, all expense incurred by the United States for operation and maintenance and which thereupon would constitute "charges" for that year will be covered into the construction account. That is, they will be transferred from the operation and maintenance account to the construction account. If at the time operation and maintenance is assumed by the water users no operation and maintenance expense has been incurred during the current year, there will be no operation and maintenance "charges" to be transferred.

The suggestion has been made that the clause discussed requires that the operation and maintenance cost for the year control is assumed be paid by the United States and charged into construction, whether operated by the United States for the full year or by the water users during a portion of that year. In the latter case the cost of operation and maintenance must be advanced or the bills and other expenses incurred by the water users must be paid by the United States monthly or otherwise.

It is not believed that the phrase "operation and maintenance charges" is synonymous with operation and maintenance

expense. The term "operation and maintenance charges" is one that heretofore has had a well-defined significance, meaning charges due the United States for service performed in operation and maintenance of the project, which is the interpretation given it in this connection. It could hardly mean in this sentence cost incurred by the water users for their own benefit after control has been assumed. Therefore the United States is not called upon to advance or pay to the water users a sum sufficient to enable them to operate and maintain the project for themselves, merely in order that there may be "charges" in the operation and maintenance account to be transferred to the construction account. Had this been intended the word "expense," or some term other than "charge" should have been employed. It is believed the provision is designed merely to obviate the necessity of the water users being required to pay in one year operation and maintenance charges for two seasons which would be necessary when changing from the present plan, under which payment is made at the end of the season, to that which requires payment in advance.

Subsection G of the act provides:

That whenever two-thirds of the irrigable area of any project or division of a project shall be covered by water-right contracts between the water users and the United States, said project shall be required, as a condition precedent to receiving the benefits of this section to take over, through a legally organized water users' association or irrigation district, the care, operation, and maintenance of all or any part of the project works, subject to such rules and regulations as the Secretary may prescribe, and thereafter the United States, in its relation to said project, shall deal with the water users' association or irrigation district, and when the water users assume control of a project, the operation and maintenance charges for the year then current shall be covered into the construction account to be repaid as part of the construction repayments.

The application of this subsection to any project or division depends on the question whether two-thirds of the irrigable area of the project or division in question is covered by water-right contracts. Such contracts may be either in the form of accepted water-right applications from water users or a contract with the district or other water users' organization covering the entire irrigable area or two-thirds thereof. The intent of this subsection is to encourage the water users in the taking over of the operation of the irrigation works or a part thereof

on each project. Such operation and maintenance by the water users' organization is a prerequisite to the granting of the benefits of the new plan of payments and also to the funding of delinquent charges under subsection L and the deferment of charges under subsection F.

Subsection I provides—

That whenever the water users take over the care, operation, and maintenance of a project, or a division of a project, the total accumulated net profits, as determined by the Secretary, derived from the operation of project power plants, leasing of project grazing and farm lands, and the sale or use of town sites shall be credited to the construction charge of the project, or a division thereof, and thereafter the net profits from such sources may be used by the water users to be credited annually, first, on account of project construction charge, second, on account of project operation and maintenance charge, and third, as the water users may direct. No distribution to individual water users shall be made out of any such profits before all obligations to the Government shall have been fully paid.

The difference in the language used with reference to the total accumulated net profits from past operations which it is provided, "shall be credited to the construction charge of the project" and the language used with reference to net profits thereafter secured from such sources, which, it is provided, "may be used by the water users to be credited annually, first on account of project construction charge, second on account of project operation and maintenance charge, and third as the water users may direct" indicates a different intent with reference to these two classes of profits. The last sentence of this subsection reading, "No distribution to individual water users shall be made out of any such profits before all obligations to the Government shall have been fully paid," appears to apply to all profits of both classes. The credit of the "total accumulated net profits" from past operations, as determined by the Secretary, "to the construction charge of the project" results in lessening by that much the total construction obligation, consequently construction payments on the basis of average gross acre income would be completed at an earlier date than would otherwise be the case; but each annual installment based on the average gross acre income would remain the same until the end of the payment period. But the provision with reference to net profits hereafter realized from such sources to be credited annually first on account of project con-



struction charge and second on account of project operation and maintenance charge, is understood to provide for the application of future profits annually upon the annual construction charges as the same come due. That is, such credit for future profits will be applied annually, first to construction charges, beginning with the construction installment first coming due and continuing with subsequent construction installments as far as such credit will go, and then in the same manner upon operation and maintenance charges when the time arrives that the project construction charges have been completed.

Subsection J provides that profits of the class described in that subsection shall be credited to the project or division of project to which the construction cost has been charged, but does not specify whether the same should be credited on construction or operation and maintenance. It is therefore believed to be within the discretion of the Secretary of the Interior to determine the manner of applying such credit. In this connection, however, it is noted that this fund is to be applied as a credit and not turned over as a cash payment from the Government. Consequently if the water users' organization takes over the operation and maintenance of the irrigation system or a part thereof and collects and pays its own operation and maintenance expenses there will be no indebtedness from the water users to the United States for operation and maintenance except the operation and maintenance of reserved works in cases where only a part of the irrigation works are turned over and in cases where all of the irrigation works are turned over there would be no indebtedness to the Government on which a credit could apply except indebtedness for the construction payments.

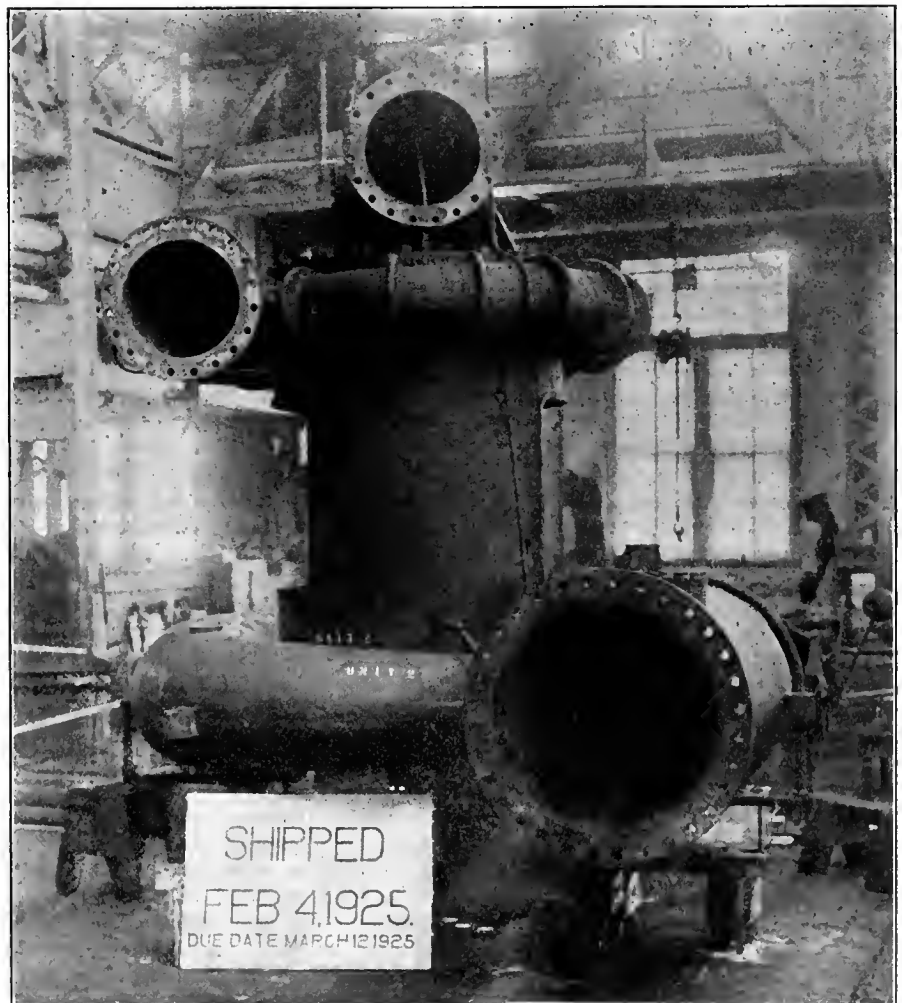
Subsection L of the act provides—

That in any adjustment of water charges as provided in this section all due and unpaid charges to the United States, both on account of construction and on account of operation and maintenance, including interest and penalties, shall be added in each case to the total obligation of the water user, and the new total thus established shall then be the construction charge against the land in question.

In this subsection the words "in any adjustment of water charges" are understood to indicate the time which will determine what charges are due and unpaid and what charges will thereafter be added in each case to the total obligation of the water user. It is believed that the adjustment of water charges occurs on the date when the adjustment contract is made and that the charges due and unpaid on that date are the charges added in each case to the total obligation.

Attention is called to the fact that so far as the construction charges are concerned, the provisions of subsection L and the provision of the last sentence of subsection F may overlap if the adjustment contract is made at a date later than December 1, 1925. As the provision with reference to the deferment of construction charges is "for a period of three years from the approval of this section" so that the three years' deferment, if granted applies to the construction charges of 1925, 1926, and 1927; and in the event of an adjustment contract of later date than December 1, 1925, providing for deferment of construction charges, the 1925 construction charges would be a delinquent charge covered by subsection L as well as by the deferment provision of subsection F. It may be argued that the language of subsection L tends to encourage dilatory practices

in the making of adjustment contracts under the new act. But this would not be true as to construction charges under any contract providing for deferment of construction charges as such construction charges for 1925, 1926, and 1927 would in any event be funded, and as applied to operation and maintenance charges the provision of subsection L would have to be considered in connection with section 6 of the extension act, which states, "no water shall be delivered to the lands of any water-right applicant or entryman who shall be in arrears for more than one calendar year for the payment of any charge for operation and maintenance or any annual construction charge and penalties." This provision is still in force and will prevent any extensive delay with reference to the operation and maintenance charges in question.



One of two water-wheel-driven pumping units for the Orchard Mesa pumping plant, Grand Valley project, Colorado. These units will each deliver 30 cubic feet per second at an elevation of 130 feet. These pumps replace a worn out plant which has supplied water to the highly cultivated lands of the Orchard Mesa district for many years. Through the cooperation of the contractor, the Worthington Pump and Machinery Company, shipment of these units has been made several weeks in advance of the contract date, thus insuring the delivery of water to these lands early in the coming season.

## LAND CLASSIFICATION ON THE PROJECTS

*Local cooperative committees are appointed on each project wishing to take advantage of the fact finders' bill to make a classification of the project lands for the information of the Board of Survey and Adjustments*

FOR the purpose of carrying out the provisions of subsection K of the fact-finders' bill, a committee, known as the local cooperative committee, has been formed on each project wishing to take advantage of the law. Ordinarily this committee consists of three members, composed of two water users selected by the organization of water users, and the project superintendent; or of one water user from each division of a project in case there are two or more divisions, and the project superintendent; thus giving at least two representatives of the water users on each of these cooperative boards. One of the first duties of this local cooperative committee is to secure and supervise a classification of the project lands, according to the following regulations:

### PROJECT LAND CLASSIFICATION

*Purpose.*—This survey is intended to determine for the project (a) the areas of permanently or temporarily unproductive lands, and (b) the areas of lands of different productive power. The unproductive lands will be made the subject of a report to Congress under subsection K of the act of December 5, 1924, and the areas of lands of different productive power will be used in the application of the new method of repayment as authorized in subsection F of the same act.

*Classes.*—It is intended that the productive lands of the project be grouped into four classes, the best lands as No. 1, and the poorest as No. 4; and that the unproductive lands be grouped into two classes, those temporarily unproductive as No. 5, and those permanently unproductive as No. 6.

It may be found on some projects that the productive lands may be grouped into only two or three classes. Whenever this condition exists there will be no need of a more refined classification. Likewise, on some projects all the lands may be agricultural. In such cases classes 5 and 6 are not considered.

The primary object of the survey should be to separate the lands into classes according to the producing power of the land, whereby the purposes of subsections F and K of the above-named act may be accomplished.

*General considerations.*—The land classifiers should consider in their examinations, assuming a water right sufficient for crop needs, (a) the natural productive power of the soil under good agricultural

practice, (b) other conditions that influence productivity such as uneven topography, making irrigation difficult and expensive, alkali, gravel subsoil, hardpan, water-logging, forest covering, etc., and (c) the distance of the land from railroads and other carriers, and from markets. The combination of these factors will determine the class to which a given farm unit belongs. All lands should be rated according to their relative possible productivity under good farming methods. Therefore, good land, yielding small crop returns because of improper farming, should be classed with good land, well tilled, and giving large crop returns. As far as possible the farmer, as a factor in crop production, should be eliminated from consideration.

*Rules.*—The following rules for classifying project lands are only suggestive. Each project has its own peculiar problems and, therefore, the local classifiers must make such adjustments as will make the plan applicable under existing conditions. It is presupposed that the local committee in charge and the classifiers will be personally and intimately familiar with soil conditions on the project, and that the classifications will be based, largely, upon this knowledge.

The inherent fertility of the soil and the topography of the land are the two chief factors of consideration. Distance from carriers or markets is usually of minor importance. The relative possible acre income under comparable systems of agriculture should be the determining test.

*Class 1.*—Lands that with sufficient water and under approved systems of tillage, produce the best crops on the project, and that have such even topography that they may be easily irrigated, with a minimum of leveling and labor under the approved system of irrigation practice for the project. These are the best lands on the project—of good soil and good topography.

*Class 2.*—Lands of the same productive power as those in class 1, but with a topography so uneven as to require more expense and more labor in the tillage and irrigation of the fields. Such lands because of their topographic difficulties are generally less capable of sustaining a completely diversified kind of agriculture. These are usually good lands of poor topography.

*Class 3.*—Lands of lower fertility or productive power, even with ample water and under good systems of husbandry,

than those of the above classes. These lands may have even topography, therefore easily irrigated, but are incapable of producing the yields of the lands under classes 1 and 2. The cause of this infertility may be inherent in the soil or may be due to alkali, gumbo, blow sand, shale, shallow or porous soil, or other factors characteristic of the project. These are poor lands, often of good topography.

*Class 4.*—Lands of poorer productivity than those of class 3, or of the same grade as class 3, but with such unfavorable topography as to increase the expense of cultivation and irrigation and to decrease the crop yield. These are poor lands of poor topography, often with excessive slopes.

*Class 5.*—Lands that are not at present susceptible of agricultural use, but which may gradually by tillage and under changing conditions be made sufficiently productive to justify cropping. Alkali and water-logged lands that may be improved by drainage; excessively heavy soils that may be improved by the incorporation of organic matter or indirect fertilizers; light, sandy soils that may be firming by plant roots; steep soils that may be leveled, and other such soils, should be included in this class.

*Class 6.*—Lands that appear to be permanently nonagricultural under the practices of irrigation farming.

*Organization.*—The project land classification or practical soil survey is in charge of the local cooperative committee. The board should choose a chairman from among its members.

The local cooperative board should employ one or more land classifiers, depending upon the time available and the local conditions, who should do the actual field work and report to the committee.

*Preliminary work.*—At least one day and preferably two days should be spent by the committee and the classifiers jointly in a thorough consideration of the application of the general rules to the conditions of the project. This is best accomplished by the committee and the classifiers spending the time in the field for the purpose of actually classifying some of the more difficult units on the project. The difficulties thus presented, discussed, and decided, will greatly help the classifiers in their later independent work.

On one of the most difficult projects this method was followed. After a unit

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## ADEQUATE FARM LOANS FOR IRRIGATED LANDS

*Extracts from comprehensive paper presented by B. J. Seger, Secretary-Treasurer of the North Platte Valley Water Users' Association and the Farmers' Irrigation District before the Nebraska State Irrigation Association*

IT IS not the purpose of this paper to present a plan for securing loans which will enable the landowner who is already deeply in debt to increase his indebtedness; but to show, if possible, how adequate loans may be secured where it is not possible at the present time.

Practically every farmer who buys land under an irrigation project has some cash and equipment at the start; but whether much cash or little, he builds improvements in accord with the cash he may have, with the result that his funds are soon exhausted and usually he has not been in the community for sufficient time to establish his personal credit. If he tries to borrow on his land from regular loan agencies, he seldom meets with success. The local bank as a rule is not in position to loan sufficient funds on the security the individual farmer is able to give, nor can the banker loan him for sufficient length of time to give the farmer opportunity to get his farming operations on a paying basis. How, then, can the irrigation farmer or landowner secure a loan for a sufficient amount which will allow him to purchase needed stock and equipment?

In a good many communities in this and other States, groups of farmers have organized mutual loan associations for the purpose of purchasing dairy stock. Where properly organized, they have been successful. The amount of authorized capital depends on the size of the organization. The par value of one share is \$100. Four kinds of stock are sold—paid-up stock, partial-payment stock, investment paid-up stock, and partial-payment investment stock. After sufficient funds are secured from the sale of stock, money is then loaned at a low rate of interest to those desiring to purchase dairy stock, the cows purchased being given as security.

Such an organization could be organized by a group of 100 to 500 land owners on a somewhat larger scale. An organization of this kind could be organized under the present laws of the State if the name included the word "savings" such as Mutual Loan and Savings Association.

It would be feasible for land owners under new projects and those land owners under one or more older projects to organize such an association. In combining several projects, especially if small, it would be possible to provide sufficient funds to loan to the stockholders if funds from some outside source could be secured equal to the amount raised from the sale of stock of the association.

The United States Department of Agriculture recently issued a bulletin entitled "Irrigation District Operation and Finance," in which it was stated that two of our Western States have assisted irrigation districts in those States by loaning the credit of the State, in this manner: The State issues bonds which are sold and the proceeds of the bonds loaned to the irrigation district. The district pays the interest on the bonds, and takes up the bonds at the end of 5 or 10 years.

Since this has been done in other States with good results, provision might be made whereby the State of Nebraska would loan its credit in the same manner to loan associations formed under irrigation projects for agricultural purposes, making it possible for the association to borrow an amount equal to the paid-up stock of the association. This would furnish sufficient funds with which to make loans. The amount loaned to the individual could be increased from year to year, as the funds for loan purposes increased. All loans to the members should be from one to three years with interest at 5 to 6 per cent.

After the association had been organized for a few years, funds would be returned from interest and loans paid, which would enable the organization to have a revolving fund large enough for the needs of the members.

The advantage of such an organization on a new project would be that all of the improvements, stock, farm equipment, and credit of its members could be utilized to the fullest extent as security behind the stock issued. The members of the association would be enabled to borrow money at a low rate of interest with which to purchase income-producing stock and needed improvements. The better the farmer's equipment for bringing in returns, the quicker would he be able to get on his feet financially.

A mutual loan organization would not need to interfere with the regular banking business in the community, as the banks prefer 30, 60, and 90 day loans. With such an organization on the projects to take care of the long-time loans, the banker would be able to adhere to the short-time loans. Since none but stockholders could secure loans from the association and only for agricultural purposes, there would still be a large field for the services of the local banker.

With a loan association on the projects to take care of the needs of the farmer for the first few years, he would soon be established on a good financial basis. Members of such an organization would have no trouble in securing real estate loans from the Federal land bank or from the Lincoln Joint Stock Land Bank. The fact that such landowners had a success-

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## PROJECT LAND CLASSIFICATION

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had been examined and discussed a secret ballot was taken on the class in which the unit should be placed. A committee of six thus voting were unanimous on seven units, and had only one dissenting vote on six other units. Care in this preliminary work will ultimately save time, and bring about a better appreciation of the work among the water users.

*Cooperation with the water users.*—The land classifier should discuss as far as practicable each unit with the individual landowner. The farmers are usually the best judges of the producing power of the soil, and they know the local conditions that the classifier must consider. No person is as close a student of a farm unit as the farmer who lives on and operates the farm, and who not only has the opportunity but the incentive to make a close study of these matters. Such con-

sultation between the land classifier and the farmer is important also because the farmer appreciates the privilege of discussing the problem with the classifier even though the result is not materially affected by such consultation.

*Report to local cooperative committee.*—The land classifier should report regularly the work that he has done, giving clearly each farm unit and the class to which it has been assigned. The local cooperative committee should then review, test, and accept, or change the findings of the classifiers.

*Soil map.*—A map of the project should be prepared in the project office, on which the land classification should be indicated, each class to be designated by a special color or shading. This map should show clearly the lands proposed to be excluded from the project.

## CREDIT CORPORATIONS AND LOAN ASSOCIATIONS

*Mr. Seger discusses the advantages of these two methods of financing the settlers, pointing out the importance of the best possible financial basis in connection with the economic development of the projects*

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ful loan organization would give the loan companies confidence in the individual members and in their ultimate success.

It is quite certain that loans secured from the Federal land bank will be more satisfactory as to amounts loaned, when irrigation projects and the landowners under them realize the importance of getting their indebtedness on a basis which will not be burdensome to them, and therefore not so hazardous for the loan company.

The joint stock land bank has not yet made any loans on irrigated lands in Nebraska. I believe that it will do so just as soon as a project and the landowners under it can demonstrate their ability to pay their obligations when due. The rules of this bank permit it to make loans to a landowner whether he lives on the land or not; but the owner must live in the vicinity of the land so that he can give the operations of the farm his personal supervision.

Both of the loan agencies mentioned make farm loans at a low rate of interest on the amortized plan of repayment. After a number of years of experience this plan of repayment is found to be the most satisfactory. This kind of loan seems to be the best for the landowner for the reason that the yearly payments are not excessive, and a small part of the principal is paid each year.

I am fully convinced that it would be entirely feasible and proper to ask the State not only to lend its credit to enable irrigation farmers to secure working capital, but to show more interest in the agricultural problems of the farmer on irrigated lands. It is certain that the irrigation farmer must be able to secure loans at a low rate of interest and for a reasonable length of time for repayment if he is to succeed.

We will now consider loans under old-established irrigation projects, including the North Platte (Interstate) project.

The first plan I wish to consider is the feasibility of organizing an agricultural credit corporation. I would consider this plan practical only for the larger irrigation projects. Such a corporation can be organized with five or more persons, and is very much the same as any corporation in its organization and purpose with the exception that it is subject to the approval and under the supervision of the United States Comptroller of the Currency. Provision is made in the Federal land bank act for such a corporation. An agricultural credit corporation can not organize

without a paid-up capital of not less than \$250,000. This organization operates in some respects like a bank. It may discount notes, warehouse receipts, and other paper, and may borrow money and loan money at a rate not to exceed the legal rate for the State. Such an organization must deposit its surplus funds in a Federal reserve bank.

*Certain irrigation districts that have made a special effort to see that at least one year of irrigation taxes were paid each year have been well repaid for the effort, and I am sure that the boards of such districts would not think of relaxing in their efforts to secure the payment of taxes. They feel that the time is past when a landowner should receive water year after year and make no effort to pay his irrigation taxes.*

*It is quite certain that if every irrigation district board represented here would start in now with the proposition that no water would be delivered to a single tract of land unless at least one year of taxes were paid, those districts would find their credit and that of the individual landowners materially increased.*

As the agricultural credit corporation is for the purpose of assisting the farmer, all loans must be for agricultural purposes, such as the purchase of dairy cows and improvements. If sufficient funds could not be raised from the sale of stock in the beginning, the same plan could be used as for new projects—that is, securing the loan of the credit of the State for funds equal to the amount of paid-up capital, the loans made by the agricultural credit association to be for one to three years with approved security. Such an organization should include considerable territory, such as an entire county or a large project having from 50,000 to 100,000 acres of land. An organization of this character, if well established, and after it has gained a credit standing with the Federal reserve banks, would have no difficulty in securing funds for loan purposes.

On reclamation projects, not only the credit of the State might be secured, but also that of the Government. Reclamation funds might be loaned for this pur-

pose. That fund receives about half a million dollars per month from the sale of public land and oil leases. It would be entirely reasonable to ask that the Government loan to its own reclamation projects, where an agricultural credit corporation or a credit association had been properly organized, an amount equal to the paid up capital of the organization, on the dollar matching plan.

This plan is used in the building of roads, with the difference that the money furnished by the Government for road building is never paid back, whereas the money borrowed from the reclamation fund for loan purposes would be paid back with interest at the rate of 3½ to 4 per cent. The Government has already furnished \$400,000,000 for road building to States putting up an equal amount. It would be practical for the Government to loan funds to the State and the State in turn to loan to agricultural credit associations or mutual loan associations under regulations similar to the method now used for furnishing money for the building of State and Federal highways.

With the money borrowed from the State or reclamation fund as the case might be, added to that received from the sale of stock, a fund would be built up in a comparatively short time which would be ample for loan purposes, and when the loans began to be repaid a revolving fund could be built up, so that there would always be funds to loan on proper security.

With the new reclamation relief bill which has recently been enacted into law, it would be a most opportune time for the land owners under Government projects to organize an agricultural credit corporation. A strong organization could be built up in a short time which would serve the needs of the Government projects on both the north and the south side. Even with the new relief bill in operation practically all land owners under the two projects will need loans at a low rate of interest to take up high-interest-bearing debts and to purchase needed income-producing stock.

The second plan, the mutual loan association, might be more satisfactory for the smaller projects. The land owners on several of the smaller projects might join together and organize one agricultural credit corporation which would serve the needs of all.

With mutual loan associations or agricultural credit corporations to assist the land owner on irrigation projects in secur-



ing one to three-year loans at 5 to 6 per cent, the farmers would in a few years have such a good financial standing that the Federal land bank and the joint stock land bank would be willing to come in and make adequate loans for the long-time periods at a low rate of interest. When that time came, there would be no foreclosures, for the loans would be the kind on which the principal never becomes due.

No project can be an entire success, no matter what the plan of financing may be, unless some definite system is established for the collection of irrigation taxes each year. Our present law provides that an irrigation district board may refuse to deliver water to land owners who owe more than one year's irrigation taxes. This law might be considered lax in comparison with many western irrigation projects, where it is required that the irrigation taxes be paid before water is delivered to the land. I believe that our own State law is good if irrigation district boards would enforce its provisions. I believe that the time is coming soon when the irrigation district boards which make no effort in the matter of the collection of taxes, will be considered failures by financial and loan companies, and those agencies will refuse to purchase securities of such projects and will refuse to make loans on those lands.

To sum up briefly: First, realize the importance of having the irrigation system of both new and old projects on the best possible financial basis and in good physical condition with the debt spread so that the yearly charges can be met easily by placing the bonded debt on a serial plan for repayment, paying not less than 1 per cent of the principal each six months, and if warrants are two or more years behind in payment, fund the warrants into a short-time serial bond issue and thus get the district on a cash basis.

Second, on new projects, if adequate loans can not be secured, organize mutual loan associations, combining with several older projects when advantageous to do so, the State to loan its credit by issuing bonds to be sold, the proceeds equal to the amount of the paid-up capital, of the loan association to be loaned to the association, and that organization to pay the interest on the bonds so issued; these bonds to be repaid by the association in 5 to 10 years; the association to make loans to its members for 1 to 3 years at a rate of interest not to exceed 6 per cent.

Third, on well-established projects, where sufficient loans can not be secured from loan companies at a low rate of interest, organize agricultural credit corporations on the larger projects or mutual loan associations on the smaller projects; the corporation to issue stock

## YAKIMA PROJECT WIPES OUT DEFICIT

J. L. LYTEL, superintendent of the Yakima project, has brought to the attention of Commissioner Mead a very gratifying situation on this project in connection with the operation and maintenance work for the calendar year 1924.

On the Tieton division, where 32,000 acres are being irrigated, the operation and maintenance work has been handled in such a manner during the past five years that a deficit of \$2,475 existing in 1920 has been wiped out. In addition, the material on hand in the storehouse, or inventory, and all the equipment used for operation and maintenance on the division, valued at \$22,000, have been paid for out of the operation and maintenance fund; and on December 31 there was a surplus in the fund of \$8,310.

to be sold to its members and others to build up a fund; the State to loan its credit for the purpose of issuing bonds in amounts equal to the amount of paid-up stock of the corporation or the Government to loan to the State or directly to the credit corporation, to be repaid when a revolving fund has been established.

Fourth, make every effort to get the finances of the district and the individual landowners on such a good basis that the Federal land bank and the joint stock land bank and other loan agencies will prefer to place loans on irrigated lands rather than on other lands.

Fifth, realize that no financial plan will be successful if taxes are not paid with reasonable promptness; and, further, that irrigation district boards should realize that it is a part of their business to see that irrigation taxes are paid each year.

Sixth, that with the enactment into law of the new reclamation relief bill, landowners under Government projects should realize the importance of forming some form of mutual or credit corporation organization to insure success to those forming under these projects.

Success will come eventually to every irrigation project whose directors and officers make an earnest effort to get the finances of the project on a good business basis. The farmer, under such projects, will succeed when payments are so arranged that he can be certain of meeting them. A farmer can not put forth his best efforts in growing maximum crops and in raising and feeding stock if he is continually discouraged by an overwhelming amount of taxes to pay, with no relief in sight.

The operation and maintenance budget for 1925 provides for an estimated gross cost of \$88,000, the amount agreed to by the board of directors of the water users' association. Deducting the surplus of \$8,310 leaves a total of \$79,690 to be reimbursed by the water users for this work, or an average of \$2.50 per acre as compared with \$2.75 per acre in 1924.

As a result of improvement in the distribution system, lessening seepage losses, and enabling a closer control to be maintained of the distribution of the water, the percentage of the water diverted from the river and delivered to the measuring boxes at the farms has been increased from 71.9 in 1920 to 77.9 in 1924.

On the Sunnyside division the deficit in 1920 amounted to \$13,372. This has been wiped out, the value of the inventories and equipment used for operation and maintenance, amounting to \$31,500, has been paid out of the operation and maintenance fund, and on December 31 the fund showed a surplus of \$16,592. It will not be possible, however, to consider reducing the operation and maintenance cost on this division this year, as the surplus will have to be used in the reconstruction of one of the major structures on the main canal, which can not longer be delayed.

On this division, as on the Tieton division, a great deal of betterment work has been done in installing new measuring boxes, replacing wooden structures on the lateral system with concrete, graveling banks, and rebuilding turnouts on the main canal, which has enabled the operating force to keep close control of the service, and thus improve the service to the water users.

The operation and maintenance work is carried on in close cooperation with the boards of directors of the districts and water users' associations, and these boards make occasional trips over the divisions for the purpose of familiarizing themselves with the work being done and the manner in which the distribution of water is being handled.

"Completeness of effort," which formed the basis of an article in the February issue of the NEW RECLAMATION ERA, describing the results attained on the Rio Grande project, has its counterpart on the Yakima project, where, at the meetings of Superintendent Lytel with the operating forces, effort is made to impress on the water masters, ditch riders, and maintenance crews that the organization exists solely for service and that effort must be made continually to improve it.



## SMALL LANDHOLDINGS LEGISLATION IN DENMARK

*Edwin C. Voorhies, of the University of California, who has spent the past year in the Scandinavian countries, writes this instructive description of the development of the small landholdings of Denmark*

THE emigration from Denmark to America in the last third of the nineteenth and the first years of the twentieth century indicated to the Danish Government that something had to be done to keep some of the best of the population at home. The efforts in this direction are worth while noticing. In this brief presentation, however, only the salient features of the legislation will be mentioned.

The first legislation within recent times was the establishment in 1880 of two small holders' credit associations by the small holders themselves. The State itself encouraged the small holders with prizes for outstanding small farms, instruction in day and evening schools, voyages abroad, etc. Denmark still continues this work. For the year 1924-25 the sum of \$31,500 was appropriated for premiums for well-managed small farms, journeys for study, etc.

I. The problem, however, was to place people on the land, and the first act with this in view was adopted in 1899. This act, which aimed at placing farm laborers on the land, had a double purpose, (a) to improve the farm laborers' conditions by offering them easy access to land, (b) to provide the larger farms with additional labor. The law, however, was soon changed, (b) being left out of consideration.

The provisions of the law of 1909 were briefly as follows: 1. An appropriation of \$1,800,000 (\$360,000 a year for five years) for loans to farm laborers for the establishment of a small farm. 2. Farm's value (loan value) as a rule should not be above \$720. 3. Laborer had to have an amount equal to one-tenth of the farm's loan value. State furnished nine-tenths of the loan value. 4. Loan was to be paid off on exceptionally easy terms, interest 3 per cent. 5. Share was not to be less than 5 acres. 6. The farm was not to be burdened with further debt until balance due the State was 50 per cent of the original loan value. It is of interest to note the personality requirements of the settler: (a) Must be a citizen; (b) between 21 and 50 years of age; (c) must not be an ex-convict; (d) must not have used poor relief; (e) must have supported himself for at least four years in agricultural work since his eighteenth year; (f) recommendation from two known persons as to his integrity; (g) must have the means to come into full possession of farm applied for.

In 1904 a similar law to that of 1899 was passed with the following essential changes: 1. Loan of \$2,700,000 in five equal amounts. 2. Restriction to farm workers removed. 3. Loan value raised to \$900.

A new law in 1909 (1) appropriated \$3,600,000 (five equal amounts); (2) applicants' list widened to include unmarried women; (3) loan value raised to \$1,170 (\$1,440 in exceptional cases); (4) additional loans granted to owners under laws of 1899 and 1904 to obtain additional land or to make thorough ground improvements; (5) restrictions as to additional mortgage removed (No. 6 under 1899 law).

The 1914 law provided (1) \$900,000 a year for five years; (2) loan value increased to \$1,440 (\$1,800 in exceptional cases); (3) additional loans provided for former owners; (4) share reduced to 2.5 acres. In 1917, however, this law was changed since (1) the limit was again put back at 5 acres and (2) the loan value was raised to \$1,800 (\$2,160 in exceptional cases).

Two laws of 1921 and 1922 introduced important changes in the earlier laws. The most important were: 1. State appropriation put at \$2,160,000 yearly. On account of the high building costs a part of the loan could be a direct appropriation; (2) the amount of the loan value and State help were to be determined by the Minister of Agriculture and the Finance Committee of Parliament; (3) loan free of interest and of part payments for five years; interest charged after five years and payments made amounting to 5½ per cent yearly. For 1921-22 the loan value was put at \$3,960, of which 30 per cent could be yielded as a direct contribution and 60 per cent as a loan. For 1922 these figures were \$3,600, 15 and 75 per cent, respectively.

In all of the laws mentioned heretofore there have been regulations with reference to repairs, sale, etc. During the time 1900-1923 some 11,000 small farms have been established. The Government loans and contributions approximate \$13,680,000.

II. In the meantime another set of laws with small holdings in view has been passed. In 1919 two laws were passed, one providing for the setting up of farms on church lands and the other encouraging the sale of land from some of the large estates. It should be stated that in both of these cases the land becomes State property. This law stated (1) that farms were to be established of such size as was

suitable for the support of a family; (2) the buyer (applicant) should pay no cash sum but should pay interest on the land value, determined by current rates of interest and the value of the land determined by periodical valuations of the farm. In the latter case, however, no account was to be taken of the value increase brought to the land by the capital or labor of the farmer. The State therefore receives normal interest from the value of the land only. In order to erect the necessary buildings the State loaned nine-tenths of what it cost to have the farm ready for occupancy. Of this loan the first \$1,080 paid interest at 4½ per cent. The remainder of the loan was interest-free. After three years the entire building loan was to be paid off with 1 per cent yearly. A later law (March 29, 1924) raised the rent bearing payment from \$1,080 to \$1,440 and payments were to start in five instead of three years. With certain limitations the small holder obtains the deed to the farm, but should he wish to sell and this person is not his heir, the State has the right to withhold its consent to sell in order to prevent speculation. In addition to the church and estate lands the Minister of Agriculture was empowered (May 6, 1921) to purchase land for \$540,000 which was to be sold under the same conditions as the land from the church and estates. In connection with the series of laws just mentioned (church land, estate land, and public land) there have been established 1,827 farms between 1919 and 1923. The average size of these has been 17½ acres.

III. Related to these two series of laws (I and II) are the State loans to combinations of farmers who will buy larger farms and split them up for the use of small farmers. A law was adopted in 1909, repeatedly readopted and in 1921 there was appropriated a yearly sum for three years of \$36,000 for the support of these unions. At the close of 1923, 30 such unions were in existence of which 9 had received State help.

IV. It will be seen from the above that the State is directly concerned in the establishment of small farms in two main forms (I and II) or systems. It is proposed to see which system gives the best results. In order to make the systems more comparable, System I was changed in 1924. The new law contains the following salient features: (1) \$2,160,000 ap-

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## DEPARTMENT INSPECTION DIVISION

THE following self-explanatory order of the Secretary was issued on January 17, 1925:

### ORDER

On August 1, 1924, an order was issued consolidating all investigating forces of the several bureaus of the Interior Department in the office of the Secretary under the general direction of a chief inspector, effective as of that date. The following supplemental instructions are now issued to define more fully the scope of the work of the division and the duties of inspectors:

1. The consolidated inspection division comprises the office of the chief inspector; the Field Service of the General Land Office; inspectors of the Bureau of Indian Affairs; special examiners of the Bureau of Pensions; inspectors of the Bureau of Reclamation; and such other employees as were or might be assigned in the several bureaus to perform duties such as are handled in the inspection division.

2. The titles used in the inspection division shall be:

- (a) Chief inspector;
- (b) Assistant chief inspector, who shall hereafter perform the duties of the Chief of Field Service, General Land Office, and such other duties as may be assigned;
- (c) Division inspectors, who shall hereafter perform the duties now performed by the field division chiefs, General Land Office.

## DENMARK LANDHOLDINGS

(Continued from page 42)

propriated for each of three years; (2) State contribution is rescinded; (3) for building loans size the provisions under II go into effect. The loan in other words under the revised System I is divided into three parts, (a) land loan which amounts to nine-tenths of the purchase price; (b) the building loan \$1,440 bearing interest; (c) the remainder of the building loan which is not charged interest. The (c) must be paid off first.

It will be seen that the essential difference between the systems in effect now (January, 1925) is merely in the ownership of the land. Under II the farmer is what might be termed a permanent renter, the rent being determined by current conditions, whereas under IV (formerly I) the land is actually purchased by the farmer.

(d) Inspectors, who shall hereafter perform the duties now performed by the special agents, examiners, and similarly designated employees in the several bureaus of the department.

3. All matters which in the judgment of officials should be made the subject of special inquiry should be referred to the inspection division with a statement of the facts, together with the papers in the case and a request for a report.

4. The work of the inspection division is primarily constructive in nature. It was established for the purpose of simplifying, coordinating, and standardizing working methods in the bureaus of the department; to increase the usefulness of the various inspection agencies to the officers of the department in promoting uniformity, efficiency, and economy; in securing and reporting to these officers dependable information in matters upon which they must pass judgment, and aiding citizens by suggestion, advice, and information in their transactions with the department.

5. In addition to the foregoing duties, the inspection force is authorized to advise and cooperate with officers and employees, both in Washington and in the field, and inquire into complaints, if any, against supervisors and employees, and alleged violations of the law; suggest and recommend changes that will bring about improved service and working conditions; and such other work as is now carried on by the inspectors and agents of the several bureaus, only under different titles.

6. In the performance of their duties, the attitude of inspectors should be courteous, helpful, and cooperative. They are agencies of the Government who can and should promote good will between it and the public which it serves. Their conduct should be such as to inspire the respect and confidence of the people in government business.

HUBERT WORK,  
Secretary.

## AMERICAN FALLS DAM CONTRACT AUTHORIZED

On January 23 the Secretary of the Interior authorized the Bureau of Reclamation to make award, enter into and approve a contract with the Utah Construction Co. for the construction of the American Falls dam at American Falls, Idaho.

Bids for the construction of the dam were opened at American Falls on January 22, and resulted as follows:

James O. Heyworth.....	\$1, 380, 000
Strange & Maguire.....	1, 354, 000
Atkinson & Atkinson.....	1, 319, 000
Utah Construction Co.....	1, 281, 000

The Utah Construction Co. was the low bidder, and the advisory board recommended the award of contract to that company on the basis of their bid as given above.

Sugar beet growers on the Minidoka project have formed an organization known as the Cassia County Beet Growers Association, with a view to securing cooperation among growers and with the sugar company, and to promote the best interests of sugar beet producers.



The new \$70,000 school building at Newell, Belle Fourche project, S. Dak.

## CATTLE FED ON BALANCED RATION

As told in a recent issue of the Montrose Daily Press, cattle at the Holly sugar factory yards at Delta, on the Uncompahgre project, are fed upon a balanced ration and their condition and weight give evidence of the value of this method of caring for cattle.

Pulp and molasses from the factory form a part of this diet, combined with cottonseed cake and hay. The feeding of the cattle is a lengthy process. Starting at 7 o'clock in the morning to feed, the work is not completed until 5 o'clock in the afternoon. There are at present about 1,800 head of cattle of the Hereford and Shorthorn strains, and over 1,000 sheep. The cattle represent an investment of about \$150,000 and the sheep between \$12,000 and \$15,000.

For each steer between 100 and 125 pounds of beet pulp are used per day, together with 15 pounds of hay, 2 pounds

of molasses, and 1 or 2 pounds of cottonseed cake.

The molasses is poured over the beet pulp while hot and mixed in a 20-ton vat for the cattle. This is kept warm and fed warm. The vat was filled up first on December 19, and will be operated until the end of the feeding period.

Three thousand six hundred feet of track running from the pulp silo to the feed pens are used to carry feed to the cattle. On either side of the track are 1,800 feet of pulp line; and four lines, 3,392 feet in all, carry the hay to the steers. Sixty acres of land, all fenced in with woven wire, are used for the cattle. The sheep lots cover 6 acres and are also well fenced. The feed for the sheep is taken in with five teams which are used all the time.

The feeding was started September 25, when there were about 200 head of

stock. Feeding will continue until about the first of July.

During this period they will use at the yards between 80 and 100 tons of cottonseed cake, worth about \$5,500; 2,500 tons of hay, worth about \$27,000; between 150 and 200 tons of straw, oats, and bean chaff, which will cost about \$8,000; 350 tons of molasses, valued at over \$6,000. In addition to this expense the pay roll of the 12 men employed amounts to about \$1,100 a month or between \$8,000 and \$9,000 for the duration of the feeding period.

About 3,000 loads of manure, which accrue during the year, are given free of charge to beet growers who find it very profitable to haul during the winter for fertilizing their fields.

The work of feeding this stock is a big one and one which is important as it makes a market for hay and straw, as well as a large number of cattle. The proposition is one which the sugar company finds is worth while and profitable for them, and affords a way to dispose of their excess beet pulp and other by-products at a profit.

## MINIDOKA SEED POTATO PRODUCTION

An average of \$333.80 per acre from seed potatoes raised on the Minidoka project, Idaho, is the record made by T. C. Gummerson, who lives on a project farm near Burley. This is a very creditable showing in view of the fact that there has been a large over-production of potatoes this year and potatoes have not been considered a very profitable crop. Good seed and good cultural methods, resulting in a high yield per acre of high quality potatoes, were responsible for the returns.

Mr. Gummerson's field consisted of 9 acres of Netteed Gems and 3 acres of Idaho Rurals. The seed used was Montana certified Russets and Idaho Rurals, which had passed the two field inspections for certification, and was grown by E. J. Konrad, of Heyburn.

From the 9 acres of Russets Mr. Gummerson sold 1,975 sacks of No. 1's, 259 sacks of No. 2's, and 50 sacks of culls, and has 80 sacks of No. 1 seed left for his own planting next year. This makes a total of 2,364 sacks, or an average of 262 sacks per acre. These potatoes brought Mr. Gummerson \$3,018.27.

From the 3 acres of Rurals, 664 sacks of No. 1's, 16 sacks of small selected seed, and 60 sacks of culls were sold, making a total of 740 sacks, or 246 sacks per acre.

These potatoes were also sold for seed and brought a total of \$987.36.

Summing up the totals for the 12 acres, Mr. Gummerson sold a total of 3,104 sacks of seed, which brought him



Field inspection of seed potatoes

\$4,005.63, or an average of \$333.80 per acre.

Although these potatoes were given more care than ordinary and were rogued during the season for undesirable plants, bringing the cost of production up considerably higher than average potatoes field grown for table stock, Mr. Gummerson still has a very nice profit left, over and above the cost of production.

## NEW CHIEF CLERK FOR WASHINGTON OFFICE

Commissioner Mead has issued an order that, effective February 1, 1925, Charles N. McCulloch, former chief of the mails and files section, is designated chief clerk of the Washington office of the bureau and placed in supervisory charge of the mails and files, appointment, and stenographic sections of the office.

Mr. McCulloch succeeds J. B. Beadle, who resigned at the end of the year to accept a position in Philadelphia with the corporation of Brock & Weymouth, of which F. E. Weymouth, former chief engineer of the bureau, is president.

J. W. Myer, who has been employed in the mails and files section for a number of years, has been designated by the commissioner as chief of that section.

Four new cotton gins are being erected on the Rio Grande project, bringing the total number on the project to 29.

## BRITISH SETTLERS GO TO CANADA

SUPPLEMENTING the brief article published in the January issue of the *NEW RECLAMATION ERA*, the following additional information is available concerning the agreement under which 3,000 British agricultural families are to be placed on the land in Canada:

The Canadian Minister of Immigration and Colonization has entered into negotiations with the Imperial Government and concluded an arrangement whereby 3,000 families are to be sent to Canada for placement on farms. These families, strictly of the agricultural type, are without the ready means to defray their transportation expenses, equip their farms, and maintain themselves until they will be getting results from their farming operations, and to tide them over this period the British Government has set apart the sum of \$4,500,000 to be advanced as loans, to be fixed according to the needs of the families and applied among other things to the purchase of farm equipment, etc. The loans will vary in amount and it is anticipated that they will average about \$1,500 per family, to be repayable over 25 years.

The farms on which these families are to be established are located in the various Provinces and are owned by the Federal

Government, and the endeavor will be, in so far as possible, to place the families in the particular Provinces for which they may have a preference, at the same time keeping in mind the vital question of where the settler will most likely succeed.

None but bona fide agriculturists actually resident in the British Isles and coming to Canada to follow agricultural work are eligible for assistance under this plan and no loans will be arranged until the families are finally approved by officers of the Canadian department. The work of selection has been in progress for the past two months and the first of the arrivals are expected in the early spring. The Land Settlement Branch will supervise the placing of the incomers and also be at their service at any time to advise and otherwise aid them to overcome any difficulties that may arise. It is believed that with reasonable endeavor on their part the settlers will meet with success.

The idea is to place the head of each family at farm employment for a year in the district where he is to be located, thus giving him an opportunity to thoroughly acquaint himself with Canadian farming methods and reduce the possibility of his proving a failure. It was at first thought that three years would

elapse before the quota of 3,000 would be exhausted, but there is every indication that the entire number will come forward in two years.

## COOPERATIVE MARKETING ON SHOSHONE PROJECT

The Big Horn Basin Cooperative Marketing Association, with which the Park County, Wyo., Farm Bureau Federation is affiliated, sold during 1924 \$171,000 worth of farm products, including poultry, beans, sweet clover, and alfalfa seed for the farmers of the Big Horn Basin. Of this amount the business from the Shoshone project totaled about \$25,500. In addition, the association disposed of about half a car of turkeys and \$8,000 worth of sweet clover seed early in 1925.

Leo L. Werts, the local representative of the association from the Shoshone project, outlines some of the advantages of the association as follows:

They deal with large responsible firms, thereby reducing the overhead expense, and receive maximum returns for their products.

Through cooperation the control of selling is democratic.

The association is governed by a grower board of directors.

The nonstock plan prevents a small number from obtaining control.

Nonprofit plan makes each grower's interest identical.



Lower Yellowstone dam, Lower Yellowstone project, Montana-North Dakota



## PUBLIC LAND SALES SHOW DECREASE

**A**CCRETIONS to the reclamation fund come in part from receipts from the sale of public land. Of interest, therefore, to the Bureau of Reclamation is a recent statement by the Department of the Interior showing that such receipts have fallen off approximately 85 per cent during the last 20 years.

The tabulation shows that such receipts declined from approximately \$8,795,000 during the fiscal year 1904 to \$1,235,000 for the fiscal year 1924. This represents a decrease of approximately \$7,560,000.

The biggest loss in receipts from the disposal of public lands during the last 20 years occurred in cash sales. In 1904 the General Land Office realized approximately \$7,445,000 from cash sales on the public domain, whereas last year the amount received from cash sales was only \$551,000. Fees and commissions on public lands disposition 20 years ago was \$1,349,990. During the fiscal year 1924 these fees and commissions declined to \$684,650.

The tabulation also shows that notwithstanding the fact that the receipts from the disposal of public lands have fallen off approximately 85 per cent during the last 20 years, the number of local land offices maintained by the Government throughout the country has been reduced only 27½ per cent. In the fiscal year 1904 the total number of local land offices was 116. During the last fiscal year there were 84 local land offices, or a reduction of 32.

Responsibility for the heavy loss in the public-land business of the Government is due to the fact that virtually all the raw public lands worthy of cultivation and capable of producing a livelihood for a family have already been taken up by homesteaders. The remaining area still the property of the Nation is therefore not attractive for homesteading purposes.

An evidence of this is found in the number of homestead entries filed on the public domain during the last fiscal year as compared with 20 years ago. In 1904 there were 69,175 homestead entries covering a total of 10,171,265 acres of public lands. For the fiscal year 1924, the number of homestead entries had dwindled to 13,886 covering 3,873,172 acres.

Homestead entries have been falling off at the rate of approximately 2,750 annually during the last 20 years.

The approximate area of the present unreserved public domain amounts to

186,000,000 acres not including the Territory of Alaska. This area represents what is left after 100 years or more of picking by hundreds of thousands of pioneers, who have been going west to build homes and to make fortunes for themselves and their families. Some of this remaining land is arid and semi-arid, requiring irrigation before being tenantable; other portions are located on steep mountain slopes which have not

even been surveyed. The soil is stony and sandy, making agricultural development an undertaking so expensive and burdensome that a homesteader would not be able to make a living from it.

Receipts from the sale of public lands, including fees and commissions, for the quarter ending December 31, 1924, that have been credited to the reclamation fund, amounted to \$205,051. The accompanying list shows the amounts credited to the fund, by States:

Arizona.....	\$7,253	New Mexico.....	\$17,372
California.....	57,897	North Dakota.....	634
Colorado.....	29,871	Oklahoma.....	892
Idaho.....	12,577	Oregon.....	14,423
Kansas.....	88	South Dakota.....	2,711
Montana.....	19,144	Utah.....	12,727
Nebraska.....	774	Washington.....	8,748
Nevada.....	3,159	Wyoming.....	25,766



A view of an irrigated section of the Uncompahgre project, Colo.

## OFFERS OF AID FOLLOW YUMA FIRE

**T**HE headquarters office of the Bureau of Reclamation on the Yuma irrigation project, Arizona, at Yuma, the Yuma County Water Users' Association building and an engine shop adjoining were totally destroyed by fire on January 24. Only the old adobe walls of the buildings were left standing, and the adjoining locomotive and equipment shed of the bureau was badly damaged by the flames and water. The Yuma fire department did yeoman service in fighting the fire, and, with the assistance of hundreds of volunteer workers, saved thousands of dollars worth of office furniture, equipment, and records.

The utmost cooperation in meeting the situation was shown by the citizens of Yuma. Among others, the Yuma Light,

Gas & Water Co., the Southwestern Ice & Manufacturing Co., the Imperial irrigation district at Andrade, and the Southern Pacific shops have all offered the use of their shop facilities to the bureau. The city of Yuma offered the use of the city building for temporary offices, and E. F. Sanguinetti offered the use of his equipment and organization for any purpose that might be helpful. The district engineer of the Geological Survey at Tucson loaned the project surveying instruments until the stock can be replaced from the Washington and Denver offices.

Commissioner Mead is especially gratified at the many offers of aid and the helpful spirit of cooperation which have made easier the meeting of a trying situation.



## COOPERATIVE RESULTS IN DENMARK

**I**MPROVED agricultural methods in Denmark, the result of cooperation, as told in Department Bulletin 1266 of the Department of Agriculture, have changed that country in one generation from a land of tenant farmers to a condition in which 92 per cent of the people own the land which they farm. Cooperative operations in connection with the production and marketing of butter, eggs, and bacon are on a specially high plane of efficiency.

Denmark stands to-day as the world's foremost country in scientific organization in production and marketing. The country has neither extreme wealth nor extreme poverty. As a result of cooperative methods the Danish farmers to-day face the world markets as one collective body of sellers rather than as 205,000 individual farmers.

Although the soils of Denmark do not compare in richness with those of the agricultural centers of the United States, the productivity of the soil has been increased greatly during the last 50 years by scientific culture and treatment and by application of barnyard manure.

The geographical situation between the densely populated industrial countries of northern Europe and Great Britain has been an important factor in this development of markets for the products of Denmark.

Seventy-eight per cent of the total area of Denmark is agricultural land and 66

per cent of the total land area is under actual cultivation. The country is now a land of middle-sized and small farms. Approximately 100,000 of these farms have an average area of 50 acres; another 100,000 have about 20 acres; and the other 5,000 of the 205,000 farms are State farms larger than 150 acres in size.

### COOPERATION

*You have a dollar,  
I have a dollar.*

*We swap.*

*Now you have my dollar,  
And I have your dollar.  
We are no better off.*

*You have an idea,  
I have an idea.*

*We swap.*

*Now you have two ideas,  
And I have two ideas.  
Both are richer.*

*What you gave you have,  
What you got I did not lose.  
This is cooperation.—Exchange.*

The small holder, with a few acres, usually works a part of the time on the larger farms in the neighborhood, and the trend during the last decade or two has been to make the small holdings of suffi-

## IDAHO SEED GROWERS WIN MANY PRIZES

Idaho seed growers on irrigated land made a remarkable showing at the recent international grain and hay show in Chicago. In a class of 70 competitors, Idaho red clover seed took first, second, third, and all other prizes down to and including fifteenth prize, with the exception of the twelfth.

First place was won by John D. Remsberg of Rupert. Five winners live in Buhl and four in Emmett; others are in Aberdeen, Caldwell, Burley, and Eagle.

Idaho took first on alsike clover, exhibited by R. M. Cruse, of Emmett, and first on Trebi six-rowed barley, by Ed. Moser, of Aberdeen, among 54 competitors.

In this connection it is interesting to note that the Owyhee and Vale lands are not remote nor different from the seed-growing area of Idaho.

ent size to maintain a family without necessitating outside work.

An official investigation of the Danish Statistical Department on the trend of farm ownership showed that tenancy in Denmark decreased from 42 per cent in 1850 to 10 per cent in 1905.

One of the important factors in the success of the cooperative movement has been the standardization of brands of products marketed. The butter has a standard "Lur Brand," and standard tests are made of the butter. If the standard is not maintained, this brand is refused to the creamery until the standard is again raised sufficiently to satisfy the requirements.

## SUGAR-BEET GROWING ON LOWER YELLOWSTONE

The accompanying illustration shows Mr. G. E. Govey, of Sidney, Mont., on the lower Yellowstone project, standing in his 140-acre field of sugar beets, "two years from foxtail."

Mr. Govey states that he purchased this land in 1920 and for four years did not produce 50 cents an acre on account of its being water-logged and alkali. In 1922 he tilled the land and sowed it to grain in 1923. The grain was mowed for feed and in the fall of that year the land was plowed. In the spring of 1924 the ground was double disked and planted to sugar beets.

Mr. Govey harvested a crop of beets that averaged 12 tons per acre and brought a gross return of \$100 per acre. "This," he says, "shows what draining will do on seeped land."



Two years from foxtail to sugar beets on the Lower Yellowstone project

## IRRIGATION WILL HELP PER CAPITA PRODUCTION

That the development of new irrigation areas is in the nature of an economic necessity is indicated by data recently prepared by the Department of Agriculture, which show that crop production in the United States is not keeping pace with the annual increase in population. During the past 12 years the production per capita has decreased about 5 per cent.

As measured by an index number, with 100 representing the average for the five-year period 1910 to 1914, the index of crop production per capita in 1924 was only 95 per cent of the average and in 1923 only 94 per cent. The trend of crop production per capita has been lagging since 1915, with the exception of 1920.

In this connection it will be recalled that in a recent statement President Coolidge pointed out that "some minor criticism has been made as to the policy of our unrelenting development of these projects by those who have thought we were already overproducing in agricultural products. They feel that these projects should be stayed until agricultural production has readjusted itself. These criticisms lie in the lack of understanding that these projects take many years for development, that they furnish but a small portion of the total increased food supply required even by our increase in population, that the utilization of their supplies lies in the development of the West itself. A country growing so fast in population as is our own can not limit its considerations to immediate necessities. Many people now living will see this a country of 200,000,000 inhabitants."

## PROJECT BOOKLET WILL HAVE FULL INFORMATION

The Bureau of Reclamation has prepared an illustrated booklet of some 60 pages descriptive of the irrigation projects of the bureau, giving general information for prospective settlers and a plain statement of facts concerning the opportunities offered on each of the projects. This booklet is now being printed and should be available within a short time.

This will be used generally by the division of reclamation economics in Denver and the division of settlement and economic operations in Washington in furnishing reliable information concerning the projects and their opportunities to those interested.

Later on it is planned to issue special booklets, each covering only a single project, if the scheme can be developed of financing the cost through local contributions, the bureau furnishing the necessary illustrations and passing upon the text so that the statements contained in the booklets will be vouched for by the Federal Government.

In this connection it is hoped that all project organizations, such as water users' associations, irrigation districts, chambers of commerce, boards of trade, organizations of producers of special crops, sugar-beet companies, railroads, and others having the interests of the projects at heart will send to the bureau from time to time information which may be helpful in furnishing prospective settlers full and reliable data concerning opportunities on the projects.

Additional settlers are needed on virtually all the projects, and the bureau

## YAKIMA VALLEY CROPS WORTH \$36,563,047

C. A. Foresman, writing for the Yakima Herald, presents a statement which shows that, measured by gross returns, the total value of crops grown in the Yakima Valley in 1924 was virtually the same as that of 1923, a record year for tonnage production. The gross value in 1924 was \$36,563,074, as compared with \$36,696,117, the estimated value of the 1923 production. Mr. Foresman predicts, however, that when the present storage is marketed the 1924 crop will have returned more money to the valley than was finally returned by the 1923 crop.

The statement shows that 8,500 cars of apples were produced, of which 4,500 cars were shipped, valued at \$5,551,500; and 4,000 cars stored, valued at \$6,804,000. Of the 6,000 cars of potatoes grown, 58,500 tons were shipped, valued at \$1,170,000; and 49,500 tons were stored, valued at \$1,237,500. Alfalfa showed a production of 15,000 cars, of which 6,000 cars, or 84,000 tons, were shipped, valued at \$1,134,000; 9,000 cars, or 116,000 tons, were stored, valued at \$1,798,000; and 10,000 tons were fed to stock in transit, valued at \$80,000. Of the dairy products, cream amounted to 1,870,000 pounds, valued at \$317,900.

wishes to work with the local organizations in every way to secure the right kind of settlers to fill the vacancies and to see that the information furnished these prospective settlers is reliable and trustworthy in every respect.



This bunch of mortgage lifters on the Carlshad project is resting after strenuous efforts to take on flesh in the interest of their owner

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Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	V. L. Minter.....	V. L. Minter.....	Ottomar Hamele <sup>1</sup> .....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	S. O. Harper.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	A. R. McGinness.....	J. P. Siebeneicher.....	Miss M. C. Simek.....	E. E. Roddis.....	Billings, Mont.
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Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	Q. R. Barnhart.....	H. L. Holgate.....	Portland, Oreg.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....	.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	O. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	H. W. Bashore.....	L. H. Mong.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	Ottomar Hamele <sup>1</sup> .....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	V. E. Hubbell.....	Brooks Fullerton.....	Mitchell, Nebr.
Salt River <sup>2</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>3</sup> .....	.....	.....	.....	.....
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	W. C. Berger.....	J. R. Alexander.....	Montrose, Colo.
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Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	C. A. Denman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls	American Falls, Idaho	F. A. Banks <sup>4</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>5</sup> .....	C. B. Funk.....	W. S. Olligly.....	H. L. Holgate.....	Portland, Oreg.
Yakima, Tilton Dam	Rimrock, Wash.....	Walter Ward <sup>4</sup> .....	M. J. Gorman.....	C. F. Williams.....	do.....	Do.

<sup>1</sup> Attorney.

<sup>4</sup> General Superintendent and Chief Engineer.

<sup>5</sup> Superintendent of Construction.

<sup>2</sup> Project operated by Salt River Valley Water Users' Association

<sup>4</sup> Construction Engineer

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*From an address by President Coolidge  
at the Eighth Regular Meeting of the  
Business Organization of the Government  
January 26, 1925.*

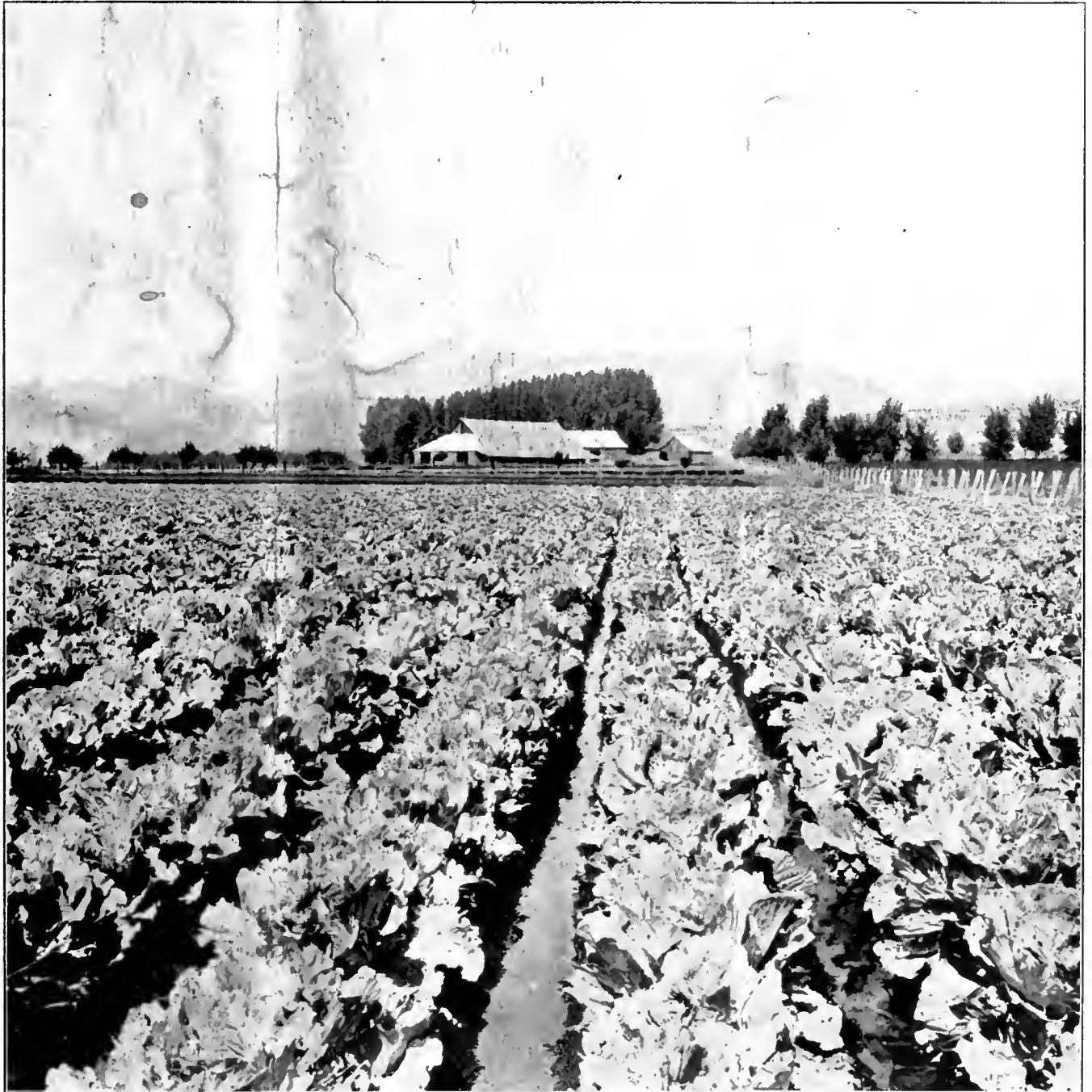
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# NEW RECLAMATION ERA

VOL. 16

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NO. 4



IRRIGATED CABBAGES ON THE KLAMATH PROJECT, OREGON—CALIFORNIA



## *The Farmer*

*THE politician talks and talks, the actor plays his part;  
The soldier glitters on parade, the goldsmith plys his art.  
The scientist pursues his germ o'er the terrestrial ball,  
The sailor navigates his ship, but the farmer feeds them all.*

*The preacher pounds the pulpit desk, the broker reads the tape;  
The tailor cuts and sews his cloth to fit the human shape.  
The dame of fashion, dressed in silk, goes forth to dine or call,  
Or drive, or dance, or promenade, but the farmer feeds them all.*

*The workman wields his shiny tools, the merchant shows his wares;  
The aeronaut above the clouds a dizzy journey dares.  
But art and science soon would fade, and commerce dead would fall,  
If the farmer ceased to reap and sow, for the farmer feeds them all.*

*—Representative Hampton P. Fulmer of South Carolina,  
in the Congressional Record of February 25, 1925.*

# NEW RECLAMATION ERA.

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

APRIL, 1925

No. 4

## CONFERENCE IN CHICAGO WITH RAILROAD OFFICIALS

*Settlement agents of the various railroads whose lines serve the projects meet with Secretary Work and Commissioner Mead to discuss coordination of activities in the interest of successful project development*

A PREREQUISITE to the successful development of new projects and the rehabilitation of those already constructed is a definite understanding and organized cooperation between the Bureau of Reclamation, State governments, railroads, and agricultural and commercial organizations. All of these organizations have the interests of the projects and of the settlers at heart, but not all are working most efficiently to attain the best results. A coordination of the various activities is the first step to be taken.

The above statement outlines the reason which prompted Commissioner Mead to suggest a conference in Chicago on March 19 of representatives of the settlement and development departments of those railroads whose lines serve the irrigation projects. The response to Doctor Mead's invitation was wholehearted and enthusiastic, and as a result the following were in attendance:

**Northern Pacific.**—John W. Haw, agricultural development agent, St. Paul; E. F. Benson, agricultural development agent, Seattle; W. P. Stapleton, agricultural development agent, Seattle.

**Great Northern.**—E. C. Leedy, general agricultural development agent, St. Paul; W. S. Weber, general agricultural development agent, Chicago.

**Union Pacific.**—R. A. Smith, superintendent of agriculture, Omaha.

**Southern Pacific.**—C. T. Collett, general agent, Chicago; G. A. Thiess, traveling agent, Chicago.

**Chicago, Burlington & Quincy.**—J. B. Lamson, agricultural development agent, Chicago; Val E. Kuska, colonization agent, Omaha.

**Atchison, Topeka & Santa Fe.**—C. L. Seagraves, general colonization agent, Chicago.

**Chicago, Milwaukee & St. Paul.**—H. F. Hunter, general agent, Chicago.

**Denver & Rio Grande Western.**—Represented by Mr. Lamson of C., B. & Q.

**Chicago & North Western.**—George Bonnell, industrial agent, Chicago.

Others in attendance at the conference were Miss M. A. Schnurr, secretary to Commissioner Mead; H. A. Brown, chief of the division of settlement and economic operations, of the Washington office of the bureau; and W. J. Donald, executive assistant to Secretary Work.

### STATE COOPERATION IN SETTLEMENT

*Commissioner Mead has written to the governor of each of the States of Montana, Nevada, Oregon, and Washington, calling their attention to the appropriations in the Interior Department appropriation act for the fiscal year 1926 for continuing construction on the Sun River, Spanish Springs, Vale, and Kittitas, projects; and in particular to the provisions requiring or encouraging cooperation between the Federal and State governments in the development of new projects.*

The meeting was opened by Doctor Mead, who stated that he had asked the representatives of the railroads to meet with him as a start toward teamwork in agricultural settlement and development, teamwork in which it was hoped to enlist as cooperators the States, the banks, the commercial bodies, and, above all, the railroads, pointing out that the representatives of the railroads, more than anybody else, understand colonization, its problems, and the means of securing settlers. Doctor Mead then introduced Secretary Work, who addressed the meeting, in part, as follows:

"We are interested in developing Federal reclamation and to do this we must get settlers on the land. You people, I take it, are interested in carrying freight to and from this land and so, assuming that that is a problem of Federal reclamation which can not be made to succeed

unless these people are properly selected, our relations then are in common interest, to protect Federal reclamation which in turn will do business with the railroads. I can readily see where there will be quite close relations. I think the conception of this meeting is a most fortunate one.

"If Doctor Mead will excuse a personal reference, I might say to you—maybe you have not realized it—that Doctor Mead is the keystone of the new policy of Federal reclamation.

"Last fall, a year ago, I instituted what we called the fact-finding committee. The personnel of that committee comprised five of the ablest men in the United States. They spent most of the winter analyzing reclamation from the beginning and recommended the establishment of a new policy which was submitted to Congress in the form of a bill, and it was enacted with slight modification. We are trying to save Federal reclamation under that new law.

"The records show that it takes three generations of people to settle this country, but it is pretty hard on the first two generations. That is where the judgment of you men in the selection of settlers is of most importance—the selection of the type of people to put on the farms. The crux of the settlement plan is to appraise a project, fix a price, a reasonable price such that a reasonably experienced, industrious farmer can take a farm on that project, make a living from the land, and pay back the Government. It is a very simple proposition when it is reduced to cold facts.

"With the cooperation of you men in the selection of settlers we can secure the right kind of farmers to go on there with reasonable expectations to develop this land, pay the Government back in reasonable time the money expended, and finally own their own homes."

Doctor Mead then pointed out that the reclamation projects under construction,

(Continued on page 50)

## OFFICIAL INTERPRETATION OF NEW LEGISLATION

*The following is a continuation of the interpretation of certain provisions of the fact-finders act of December 5, 1924. The interpretation of other provisions will be found in the March issue of the New Reclamation Era*

UNDER date of January 28 the Secretary of the Interior approved the interpretation of certain provisions of section 4 of the act of December 5, 1924. For the information and guidance of readers of the NEW RECLAMATION ERA we are printing below the official interpretation, approved by the Secretary on March 19, 1925, of additional provisions of the act.

Subsection G provides as follows:

That whenever two-thirds of the irrigable area of any project, or division of a project, shall be covered by water-right contracts between the water users and the United States, said project shall be required, as a condition precedent to receiving the benefits of this section to take over, through a legally organized water-users' association or irrigation district, the care, operation, and maintenance of all or any part of the project works, subject to such rules and regulations as the Secretary may prescribe, and thereafter the United States, in its relation to said project, shall deal with a water-users' association or irrigation district, and when the water users assume control of a project the operation and maintenance charges for the year then current shall be covered into the construction account to be repaid as part of the construction repayments.

It is necessary to construe the word "benefits" to determine the other subsections of the act to which subsection G is applicable. A strict, literal interpretation of this subsection, taken alone, would lead to the conclusion that all subsections of the act from F to R are qualified by subsection G.

However, it is to be remembered that this is a remedial statute and under the rules of statutory construction a liberal interpretation must be given of the act as a whole with a view to giving effect, if possible, to each provision. It is believed that a possible and reasonable construction is that the "benefits" mentioned in subsection G are those only which flow from the execution of the mandatory contracts, that is, those provided for in subsection F immediately following, which require some affirmative action on the part of the water user, and that it has no application to the other provisions of the act, which appear to be more general in character, and do not require the execution of amended contracts to make them effective. The other provisions are self-executing. It is believed that subsection

G means merely that if application is made for any of the benefits depending upon execution of contract and two-thirds of the irrigable area is under water-right application, the Secretary shall require as a condition precedent that the operation and maintenance of the project or the division affected shall be taken over by the water users.

Had it been intended that subsection G should qualify the other provisions of the act, this subsection should have been placed at the end or following the clauses intended to be qualified. The position alone of course is not controlling, but has a proper place in the construction of the act. Moreover, subsection I provides expressly that the benefits of that subsection shall be applicable only after the operation and maintenance of constructed works is taken over. This is unnecessary and superfluous if subsection G already limits the application of all the other subsections. Specific mention in this subsection seems to negative the idea of applicability to all subsections.

(Continued on page 51)

## CONFERENCE WITH RAILROAD MEN

(Continued from page 49)

and for which surveys have been authorized, will involve an expenditure for construction of works, for movement of settlers, and development of farms that makes transportation a matter of vital importance. Settlers are needed on all the old projects. Settlers are needed for land in excess ownership, land controlled by absentee owners, who either have left it idle or have rented to tenants; land which the present owners would be glad to sell with a view to moving to some other locality.

To people the new projects will require nearly 9,000 settlers. To fill the gaps on old projects will require an equal number.

It was shown that to equip and improve 40 to 80 acres of land for farms under irrigation will cost not less than \$5,000 to \$7,000. This will be used to clear off the sage brush, build fences, provide for plain equipment in the way of buildings for the family and the livestock, and enable the settler to live during the year in which his work must be largely unproductive.

Statistics gathered by the California State Land Settlement Board showed

about four prospective settlers with less than \$1,500 for every one with that or more capital, and about five times as many applied for farm laborers' allotments, for which the minimum requirement was \$300, as applied for farms where they had to have \$1,500 or more.

A recent study of data furnished by prospective settlers on the projects of the Bureau of Reclamation showed that 70.9 per cent had only \$1,500 or less; 18.6 per cent between \$1,501 and \$2,500; and only 10.5 per cent more than \$2,500. These facts seem to show that a large part of the settlers will have to borrow part of the money needed to make their farms going concerns.

Attention was directed to the Kendrick-Winter bill providing for aid in the settlement of Government land in irrigation projects. This bill was favorably reported by both the House and Senate Committees on Irrigation and Reclamation, but failed to pass for lack of time. It provided also Government loans for permanent improvements and for the purchase of livestock, the maximum advance

permitted being \$3,000. The ultimate passage of this or a similar bill will mean the blazing of a new trail and a radical departure from the ideas and practices which have prevailed from the time the wave of western settlement crossed the Alleghenies.

Another matter referred to by Doctor Mead was that of cooperation with the States, and it was noted that the Interior Department act for the fiscal year 1926 recognizes the fact that there is an obligation on the part of the State as well as the Federal Government in the successful development of these projects, through selection of settlers and furnishing them advice and financial assistance.

The meeting was noteworthy in forming the basis for a mutual understanding of the settlement problems confronting the railroads and the irrigation projects; in stressing the need for coordinated effort on the part of all interested in these problems; in bringing prominently to the attention of all the necessity for careful selection of settlers, their financial requirements, and the aid and direction which they should receive after being placed on a project; and in developing the need for spur lines to meet the requirements of the settlers in marketing their products.

Literal interpretation of subsection G would apparently prevent anything being done under subsection K except where operation and maintenance has been taken over under the two-thirds rule. This is certainly true if what has been therein authorized is to be called a "benefit." While further action by Congress is necessary before any charges may be remitted or adjustment made under subsection K, it would seem that the survey and report authorized to be made, manifestly with the expectation that Congress will authorize reductions, reallocations of charges and other adjustments, constitute a benefit; in fact, no doubt this is regarded by many projects and water users as the outstanding benefit of the act. It would seem that any interpretation which would prevent survey and report under subsection K, regardless of operation and maintenance being turned over, would defeat in large measure the relief manifestly sought to be extended. Such construction being absurd, should not be adopted.

A strict, literal interpretation of subsection G, standing alone, would likewise make it necessary to withhold the benefits of subsections M and Q, having only purely personal application. The bureau has had already applications for exchange of entries under subsection M from projects, the operation and maintenance of which has not been taken over. These must be denied if subsection G is applicable to such cases. Such literal interpretation would necessarily split the Washington office expense under subsection O, certain projects bearing their proportionate part of the expense after June 30, 1925, and others being exempt from such expense, dependent upon their status, which would be fluctuating. For example, against projects not open and those not having two-thirds of the irrigable area under water-right application, no expense would be chargeable on account of the Washington office. However, immediately they reach the time when two-thirds of the irrigable area is under water-right application they would begin paying and continue paying until such time as operation and maintenance shall be taken over, whereupon they would again cease paying. It would seem that had it been intended that the Washington office expense should be thus divided an arbitrary date, as June 30, 1925, would not have been selected, without some qualification and more definite connection with subsection G.

The cost of general investigations made before and after date of the act are, under subsection O, to be charged to the reclamation fund and shall not be

charged as a part of the construction or operation and maintenance payable by the water users of the projects. There is no practical way in which effect may be given to this provision if it is to be dependent upon the transfer of operation and maintenance to the water users. Such investigations can be in nowise affected by the matter of operation and maintenance. Apparently the only possible difference would be the time credit may be applied, as sooner or later the operation and maintenance of all projects must be taken over under the law. Hence there is no possible reason for applying subsection G to this item.

It is believed that the construction that subsection G qualifies only the provisions of subsection F (and L, which is dependent upon contract adjustment under F) is a reasonable and proper one. That it will be attended with fewer complications than any other must be conceded. The accounting will be thereby greatly simplified and the expense lessened. On the whole the administration of the act will be made much easier. Any doubt that may exist in the respects mentioned should be resolved in favor of the water user. Any other interpretation than that here suggested would work great inequality, lead to much confusion, and would defeat in part the intention of Congress.

### **ECONOMIC SURVEY BASIS OF LAND SETTLEMENT**

Dr. Richard T. Ely, in a recent address before the National Fertile Land Conference, stated that honesty and fairness in dealing with our frontier settlers necessitates solving the problem of land utilization, and in this connection he pointed out the need of the economic land survey and the certification of land, as well as the importance of cost and income researches, to the end that losses not only in our economic but in our human resources may be decreased.

"If in land settlement we are to have a square deal for the individual and the Nation we must have a planned-out settlement along with economic survey. We must aim at the closer settlement of land, because scattered settlements involve heavy expenditures for all social and economic purposes. Schools cost more, as do all the conveniences and amenities of life; for example, roads, and other public utilities. We want the rural population to be the best possible, and where the settler does not have a square deal, we have a depreciation of human values."

### **REGULATIONS UNDER SUBSECTION H**

These regulations are urgently needed because of payments which are maturing and being made. There exists some uncertainty regarding the amount of penalty which shall be charged and collected.

The subsection provides that a penalty of 1 per cent per month against delinquent charges prescribed in sections 3 and 6 of the reclamation extension act is reduced to one-half of 1 per cent per month as to all installments which may become due after the passage of the act. It has been suggested that this subsection is qualified by subsection G of the same act already discussed. The contention is made by some that where the project has been opened and two-thirds of the irrigable area is covered by water-right contracts, the reduction of penalty will apply only after the operation and maintenance has been taken over as provided in subsection G.

It is not believed that it was the intention of Congress to penalize an individual water user or withhold a benefit on account of something for which he is in nowise to blame and over which he has no possible control; but rather that Congress intended to reduce the penalties named on all installments subsequently accruing without regard to whether the operation and maintenance of the project, or the division of it affected, has been taken over.

The language makes this subsection applicable to all installments which may hereafter become due. This is true without regard to whether the operation and maintenance of the project or division has been turned over as provided in subsection G of the same act.

Subsection H is applicable likewise to rental charges fixed under section 11 of the reclamation extension act of August 13, 1914 (38 Stat. 686), which provides that such charges shall be subject to the same penalties as provided for other operation and maintenance charges.

All charges other than those specifically mentioned in these regulations will be governed, as heretofore, by the contracts or provisions of law applicable.

Penalty of 1 per cent per month as provided by the reclamation extension act will be charged against all installments becoming due prior to December 5, 1924, until paid, except, of course, when such penalty is modified by some of the various relief acts. On all installments becoming due after December 5, 1924, the penalty provided by subsection H will apply.

The importance of having men with business capacity to head up cooperative organizations can not be overestimated.

## RECENT FEDERAL IRRIGATION LEGISLATION

*The appropriation act for the Bureau of Reclamation and other enactments concerning the irrigation of arid lands in the West, including the fact-finders bill*

### BUREAU OF RECLAMATION

**T**HE following sums are appropriated out of the special fund in the Treasury of the United States created by the act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

For all expenditures authorized by the act of June 17, 1902 (Thirty-second Statutes, page 388), and acts amendatory thereof or supplementary thereto, known as the reclamation law, and all other acts under which expenditures from said fund are authorized, including personal services in the District of Columbia and elsewhere; examination of estimates for appropriations in the field; refunds or overcollections hereafter received on account of water right charges, rentals, and deposits for other purposes; printing and binding, not exceeding \$25,000; purchase, maintenance, and operation of horse-drawn or motor-propelled passenger-carrying vehicles; payment of damages caused to the owners of lands or private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, or maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior; and payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior: *Provided*, That no part of said appropriations may be used for maintenance of headquarters for the Bureau of Reclamation outside the District of Columbia except for the office of the chief engineer:

Salt River project, Arizona: For examination of project and project accounts, \$5,000;

Yuma project, Arizona-California: For operation and maintenance, continuation of construction, and incidental operations, \$432,000: *Provided*, That the unexpended balance of the \$250,000 authorized in the act approved June 5, 1924, for the construction of a hydroelectric power plant at the siphon drop on the main canal is reappropriated for the fiscal year 1926 and made available for the same purpose and under the same conditions as provided in said act;

Orland project, California: For operation and maintenance, continuation of construction, and incidental operations, \$34,000;

Grand Valley project, Colorado, including Orchard Mesa division: For operation and maintenance, continuance of construction, and incidental operations, \$278,000;

Uncompahgre project, Colorado: For operation and maintenance, continuation of construction, and incidental operations, \$163,000;

Boise project, Idaho: For operation and maintenance, continuance of construction, and incidental operations, \$439,000: *Provided*, That the expenditure for drainage shall not exceed the amount

paid by the water users pursuant to the provisions of the Boise public notice dated February 15, 1921, except for drainage in irrigation districts formed under State laws and upon the execution of agreements for the repayment to the United States of the costs thereof;

King Hill project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$35,000;

Minidoka project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$797,000;

Huntley project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$118,000;

Milk River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$76,000;

Sun River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$611,000: *Provided*, That no part of this appropriation shall be used for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law, providing for payment by the district or districts as hereinafter provided. The Secretary of the Interior shall by public notice announce the date when water is available under the project: *Provided further*, That no part of the sum hereby appropriated shall be expended for the construction of new canals or for the extension of the present canal system for the irrigation of lands outside of the forty thousand acres for the irrigation of which a canal system is now provided, until a contract or contracts shall have been executed between the United States and the State of Montana, whereby the State shall assume the duty and responsibility of promoting the development and settlement of the project after completion, securing, selecting, and financing of settlers to enable the purchase of the required livestock, equipment, and supplies and the improvement of the lands to render them habitable and productive. The State shall provide the funds necessary for this purpose and shall conduct operations in a manner satisfactory to the Secretary of the Interior: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands;

Lower Yellowstone project, Montana-North Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$180,000.

North Platte project, Nebraska-Wyoming: For operation and maintenance,

continuation of construction, and incidental operations, \$510,000: *Provided*, That any unexpended balance of any appropriation available for the construction of the Guernsey Reservoir and incidental operations for the fiscal year 1925 shall remain available for such purposes during the fiscal year 1926: *Provided further*, That all net revenues from any power plant connected with this project shall be applied to the repayment of the construction costs incurred by the Government on this project until such obligations are fully repaid;

Newlands project, Nevada: For operation and maintenance, continuation of construction, and incidental operations, \$167,000, together with the unexpended balance of the appropriation for this project for the fiscal year 1925, of which amount \$245,000 shall be used for drainage purposes, but only after execution by the Truckee-Carson irrigation district of an appropriate reimbursement contract satisfactory in form to the Secretary of the Interior, and confirmation of such contract by decree of a court of competent jurisdiction and final decision on all appeals from such decree;

Newlands project, Spanish Springs division, Nevada: For continued investigations, commencement of construction, and necessary expenses in connection therewith, \$500,000: *Provided*, That no water shall be delivered to irrigators on this division outside of the limits of the Truckee-Carson project until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment by the district or districts as hereinafter provided: *Provided further*, That no part of the sum provided for herein shall be expended for construction on account of any lands owned by the Southern Pacific Company until an appropriate contract in form approved by the Secretary of the Interior shall have been properly executed by the said company, fixing the price and conditions of sale of said lands to actual settlers, and such contract shall provide that until one-half of the construction charges against said lands shall have been fully paid no sale of any such lands shall be valid unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and shall also provide that upon proof of fraudulent representation as to the true consideration involved in any such sale the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sale; and all public lands irrigable under the Spanish Springs division shall be entered subject to the conditions of this section which shall be applicable thereto: *Provided further*, That the Secretary of the Interior is authorized to enter into such contract or contracts as may be possible whereby the State of Nevada, or local interests, shall aid in promoting the development and settlement of the project after completion by



the securing and selection of settlers and the financing of them to enable the purchase of the required livestock, equipment, and supplies and the improvement of the lands to render them habitable and productive: *Provided further*, That the operation and maintenance charges on account of land in this division shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands: *Provided further*, That the existing water rights of the present water users of the Newlands project shall have priority over the water rights of the proposed Spanish Springs division: *Provided further*, That the lands on the existing project below the Lahontan Reservoir shall not be liable for any part of the construction costs of the Spanish Springs division: *Provided further*, That all net revenues from any power plant connected with the Spanish Springs division of the Newlands project shall be applied to the repayment of the construction costs incurred by the Government on said division until such obligations are fully repaid and all net revenues from any power plant connected with the Lahontan Reservoir of the Newlands project shall be applied to the repayment of the construction costs incurred by the Government on the existing project until such obligations are fully repaid;

Carlsbad project, New Mexico: For operation, maintenance, continuation of construction, and incidental operations, \$70,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, continuation of construction, and incidental operations, \$650,000;

Williston project (formerly North Dakota pumping project), North Dakota: For operation, maintenance, and incidental operations, \$25,000, to remain available until December 31, 1925. The Director of Reclamation is authorized, during the fiscal year 1925, or thereafter, to appraise the buildings, machinery, equipment, and all other property of whatever nature or kind appertaining to this project and to lease or to sell the same at public or private sale, on such terms and in such manner as he may deem for the best interests of the Government, reserving the right to reject any and all bids. The proceeds from such lease or sale shall be paid into the reclamation fund;

Baker project, Oregon: For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1925 is reappropriated and made available for the fiscal year 1926;

Owyhee irrigation project, Oregon: The unexpended balance, if any, remaining at the close of the fiscal year 1925 from the appropriation of \$315,000 made by the act referred to as the "second deficiency act, fiscal year 1924," approved December 5, 1924 (Public, Numbered 292), for continued investigations, commencement of construction, and incidental operations, Owyhee irrigation project, Oregon, is hereby reappropriated, to be available and to continue available for use during the fiscal year 1926;

Umatilla project, Oregon: For operation and maintenance, continuation of construction, and incidental operations, \$840,000;

Vale project, Oregon: For continued investigations, commencement of construction, and incidental operations, \$500,000: *Provided*, That no part of this appropriation shall be used for construction purposes on the Vale project until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law, providing for payment by the district or districts as hereinafter provided: *Provided further*, That no part of the sum provided for herein shall be expended for construction on account of any lands in private ownership until an appropriate repayment contract in accordance with the terms of this act and, in form approved by the Secretary of the Interior, shall have been properly executed by a district organized under State law, embracing the lands in public or private ownership irrigable under the project and the execution thereof shall have been confirmed by a decree of a court of competent jurisdiction, which contract, among other things, shall provide for an appraisal approved by the Secretary of the Interior, showing the present actual bona fide value of all such irrigable lands, fixed without reference to the proposed construction, and shall provide that until one-half the construction charges against said lands shall have been fully paid no sale of any such lands shall be valid unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and shall also provide that upon proof of fraudulent representation as to the true consideration involved in any such sale the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sale; and all public lands irrigable under the project shall be entered subject to the conditions of this section, which shall be applied thereto: *Provided further*, That no water shall be delivered to irrigators on this project until a contract or contracts shall have been executed between the United States and the State of Oregon, whereby the State shall assume the duty and responsibility of promoting the development and settlement of the project after completion, including the subdivision of lands held in private ownership by any individual in excess of one hundred and sixty irrigable acres, the securing, selection, and financing of settlers to enable the purchase of the required livestock, equipment, and supplies and the improvement of the lands to render them habitable and productive. The State shall provide the funds necessary for this purpose and shall conduct operations in a manner satisfactory to the Secretary of the Interior: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands: *Provided further*, That not more than \$200,000 of the amount herein appropriated shall be available for purchase of

an interest in the existing storage reservoir of the Warm Springs project, said interest to be conveyed to the United States free of all prior liens and encumbrances of every kind whatever: *Provided further*, That the contract for the purchase of said interest in said reservoir shall also provide for construction of the necessary drainage works by the said Warm Springs and Vale projects and the proportion of cost of said works to be borne by each;

Klamath project, Oregon-California: For operation and maintenance, continuation of construction, and incidental operations, \$561,000;

Belle Fourche project, South Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$65,000: *Provided*, That the unexpended balance of \$100,000 allotted for drainage under this paragraph for the fiscal year 1925 is reappropriated and made available for such purpose for the fiscal year 1926;

Strawberry Valley project, Utah: For operation and maintenance, continuation of construction, and incidental operations, \$39,000;

Salt Lake Basin project, Utah, first division: For construction of Echo Reservoir, Utah Lake control, and Weber-Provo Canal, and incidental operations, \$900,000: *Provided*, That any unexpended balance of any appropriation available for the Salt Lake Basin project for the fiscal year 1925 shall remain available during the fiscal year 1926: *Provided further*, That no part of this appropriation shall be used for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law, or water users' association or associations, providing for payment by the district or districts, or water users' association or associations, as hereinafter provided: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands;

Okanogan project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$70,000;

Yakima project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$295,000;

Yakima project (Kittitas Division), Washington: For construction of the Kittitas Division and incidental operations, \$375,000: *Provided*, That no part of this appropriation shall be used for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment by the district or districts as hereinafter provided. The Secretary of the Interior shall by public notice announce the date when water is available under the project: *Provided further*, That

## THE FACT FINDERS ACT AND OTHER LEGISLATION

*Reappraisal of projects, with appropriation of \$150,000.—\$200,000 for Yuma Mesa; \$125,000 for Picacho Wash; \$111,000 for Little Payette Lake storage; and \$50,000 for Orland storage right of way*

(Continued from page 53)

no part of the sum provided for herein shall be expended for construction on account of any lands in private ownership until an appropriate repayment contract, in form approved by the Secretary of the Interior, shall have been properly executed by a district organized under State law, embracing the lands in public or private ownership irrigable under the project, and the execution thereof shall have been confirmed by decree of a court of competent jurisdiction, which contract, among other things, shall contain a provision for an appraisal, showing the present actual bona fide value of all such irrigable lands fixed with reference to the proposed construction of said Kittitas Division, and shall provide that until one-half the construction charges against said lands shall have been fully paid no sale of any such lands shall be valid unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and shall also provide that upon proof of fraudulent representation as to the true consideration involved in any such sale the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sale; and all public lands irrigable under the project shall be entered subject to the conditions of this section which shall be applicable thereto: *Provided further*, That no part of the sum hereby appropriated shall be expended for construction until a contract or contracts shall have been executed between the United States and the State of Washington pursuant to its land settlement act embodied in chapter 188, Laws of 1919, as amended by chapter 90, Laws of 1921, and by chapters 34 and 112, Laws of 1923, or additional enactments, if necessary, whereby the State shall assume the duty and responsibility of promoting the development and settlement of the project after completion, including the subdivision of lands held in private ownership by any individual in excess of one hundred and sixty irrigable acres, the securing, selection, and financing of settlers to enable the purchase of the required livestock, equipment, and supplies, and the improvement of the lands to render them habitable and productive. The State shall provide the funds necessary for this purpose and shall conduct operations in a manner satisfactory to the Secretary of the Interior: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands;

The unexpended balance, if any, remaining at the close of the fiscal year 1925 from the appropriation of \$375,000 made by the act referred to as the "second deficiency act, fiscal year 1924," approved December 5, 1924 (Public, No. 292), for continued investigation, commencement of construction of the Kittitas unit, and incidental operations, Yakima project, Washington, is hereby reappropriated, to

be available and to continue available for use during the fiscal year 1926;

Riverton project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$790,000;

Shoshone project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$414,000;

Umatilla Rapids project, Oregon: For investigation of the feasibility of irrigation by gravity or pumping, water sources, water storage, and related problems on the Columbia River and its tributaries, and for cooperative and miscellaneous investigations of the feasibility of reclamation projects, including personal services in the District of Columbia and elsewhere, and incidental expenses, the unexpended balance of this appropriation contained in the act of March 4, 1923 (Forty-second Statutes at Large, page 1540), is hereby reappropriated and made immediately available;

Secondary projects: For cooperative and general investigations, \$50,000;

To enable the Secretary of the Interior to meet the requirements of Article VI of the treaty of January 11, 1909 (Thirty-sixth Statutes at Large, page 2448), between the United States and Great Britain for gauging the streams and determining the water supply of the northern or eastern tributaries of Milk River, Montana, including personal services in the District of Columbia and elsewhere; the purchase, exchange, hire, maintenance, repair, and operation of motor-propelled or horse-drawn, passenger-carrying vehicles, \$10,000, to be expended under and in accordance with the provisions of the act of June 17, 1902 (Thirty-second Statutes at Large, page 388), and amendatory or supplementary acts.

Under the provisions of this act no greater sum shall be expended, nor shall the United States be obligated to expend, during the fiscal year 1926, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1926 exceed the whole amount in the "reclamation fund" for that fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual conditions an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;

Whenever, during the fiscal year ending June 30, 1926, the Commissioner of the Bureau of Reclamation shall find that the expenses of travel, including the local transportation of employees to and from

their homes to the places where they are engaged on construction or operation and maintenance work, can be reduced thereby he may authorize the payment of not to exceed 3 cents per mile for a motor cycle or 7 cents per mile for an automobile used for necessary official business;

Total, from reclamation fund, \$9,999,000.

Approved March 3, 1925.

### THE FACT-FINDERS ACT

[Extract from an act making appropriations to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1924, and prior fiscal years, to provide supplemental appropriations for the fiscal year ending June 30, 1925, and for other purposes]

SEC. 4. Subsection A. That when used in this section (a) The word "Secretary" means the Secretary of the Interior. (b) The words "reclamation law" mean the act of June 17, 1902 (32 Stat., p. 388), and all acts amendatory thereof or supplementary thereto. (c) The words "reclamation fund" mean the fund provided by the reclamation law. (d) The word "project" means a Federal irrigation project authorized by the reclamation law. (e) The words "division of a project" mean a substantial irrigable area of a project designated as a division by order of the Secretary.

Subsec. B. That no new project or new division of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

Subsec. C. That the Secretary is hereby authorized, under regulations to be promulgated by him, to require of each applicant, including preference right ex-service men for entry to public lands on a project, such qualifications as to industry, experience, character, and capital, as in his opinion are necessary to give reasonable assurance of success by the prospective settler. The Secretary is authorized to appoint boards in part composed of private citizens to assist in determining such qualifications.

Subsec. D. That the irrigable lands of each new project and new division of a project hereinafter approved shall be classified by the Secretary with respect to their power, under a proper agricultural program, to support a family and pay water charges, and the Secretary is authorized to fix different construction charges against different classes of land under the same project for the purpose of equitably apportioning the total construction cost so that all lands may as far as practicable bear the burden of such cost according to their productive value.

Subsec. E. That hereafter the Secretary shall as to each irrigable acre of land in each new project, or a new division of a project, issue two public notices relating to construction charges. The first public notice shall be issued when the land is ready for settlement and will announce the construction charge per irrigable acre. The second public notice shall be issued when in the opinion of the Secretary the agricultural development of the project shall have advanced sufficiently to warrant the commencement of payment of installments of such construction charge. The second public notice shall fix the date when payments will begin on the construction charge announced by the first public notice, which date shall be not more than five years from the date of the first public notice.

Subsec. F. That hereafter all project construction charges shall be made payable in annual installments based on the productive power of the land as provided in this subsection. The installment of the construction charge per irrigable acre payable each year shall be 5 per centum of the average gross annual income for the ten calendar years first preceding, or for all years of record if fewer than ten years are available, of the area in cultivation in the division or subdivision thereof of the project in which the land is located, as found by the Secretary annually. The decision of the Secretary as to the amount of any such installment shall be conclusive. These annual payments shall continue until the total construction charge against each unit is paid. The Secretary is authorized upon request to amend any existing contract for a project water right so that it will provide for payment of the construction charge thereunder in accordance with the provisions of this subsection or for the deferment of such construction charges for a period of three years from the approval of this section, or both.

Subsec. G. That whenever two-thirds of the irrigable area of any project, or division of a project, shall be covered by water-right contracts between the water users and the United States, said project shall be required, as a condition precedent to receiving the benefits of this section to take over, through a legally organized water-users' association or irrigation district, the care, operation, and maintenance of all or any part of the project works, subject to such rules and regulations as the Secretary may prescribe, and thereafter the United States, in its relation to said project, shall deal with a water-users' association or irrigation district, and when the water users assume control of a project, the operation and maintenance charges for the year then current shall be covered into the construction account to be repaid as part of the construction repayments.

Subsec. H. That the penalty of 1 per centum per month against delinquent accounts, provided in section 3 and section 6 of the act of August 13, 1914 (Thirty-eighth Statutes, page 686), is hereby reduced to one-half of 1 per centum per month, as to all installments which may hereafter become due.

Subsec. I. That whenever the water users take over the care, operation, and maintenance of a project or a division of a project the total accumulated net profits, as determined by the Secretary, derived from the operation of project power

plants, leasing of project grazing and farm lands, and the sale or use of town sites shall be credited to the construction charge of the project, or a division thereof, and thereafter the net profits from such sources may be used by the water users to be credited annually, first, on account of project construction charge, second on account of project operation and maintenance charge, and third, as the water users may direct. No distribution to individual water users shall be made out of any such profits before all obligations to the Government shall have been fully paid.

Subsec. J. That all moneys or profits as determined by the Secretary heretofore or hereafter derived from the sale or rental of surplus water under the Warren Act of February 21, 1911 (Thirty-sixth Statutes, page 925), or from the connection of a new project with an existing project shall be credited to the project or division of the project to which the construction cost has been charged.

Subsec. K. That on each existing project where, in the opinion of the Secretary, it appears that on account of lack of fertility in the soil, an inadequate water supply, or other physical causes, settlers are unable to pay construction costs, or whenever it appears that the cost of any reclamation project by reason of error or mistake or for any cause has been apportioned or charged upon a smaller area of land than the total area of land under said project, the Secretary is authorized to undertake a comprehensive and detailed survey to ascertain all pertinent facts, and report in each case the result of such survey to the Congress with his recommendations: *Provided*, That the cost and expense of each such survey shall be charged to the appropriation for the project on account of which the same is made, but shall not be charged as a part of the construction or operation and maintenance cost payable by the water users under the project.

(Continued on page 56)

#### APPROPRIATIONS FOR RECLAMATION, 1925 AND 1926

Projects	1926 Interior Department appropriation bill approved Mar. 3, 1925	Unexpended balances from other appropriations (columns 3, 4, and 5) made available fiscal year 1926	Second deficiency act of 1924 (H. R. 9559, Pub. No. 292, fiscal year 1925)	First deficiency act of 1925 (H. R. 11308, Pub. No. 326, available 1925 and fiscal year 1926)	Second deficiency act of 1925 (H. R. 12392, available 1925 and fiscal year 1926)
	1	2	3	4	
Salt River.....	\$5,000				
Yuma.....	432,000	\$125,000.00			\$125,000.00
Orland.....	34,000	250,000.00			50,000.00
Grand Valley.....	273,000	50,000.00			
Uncompahgre.....	163,000				
King Hill.....	35,000				
Minidoka.....	797,000				
Boise.....	439,000	\$111,000			\$111,000
Huntley.....	118,000				
Milk River.....	76,000				
Sun River (Greenfields).....	611,000				
Lower Yellowstone.....	180,000				
North Platte.....	510,000				
Newlands.....	167,000	400,000.00			
Carlsbad.....	70,000				
Rio Grande.....	650,000				
Williston.....	\$25,000				
Baker.....		495,935.04			
Umatilla.....	840,000				
Klamath.....	561,000				
Belle Fourche.....	65,000	\$100,000.00			
Strawberry Valley.....	39,000				
Okanogan.....	70,000				
Yakima.....	295,000				
Riverton.....	790,000				
Shoshone.....	414,000				
Secondary.....	50,000		\$21,500.00		
Cooperative investigations.....			125,000.00		
Yuma Auxiliary.....		200,000.00			200,000.00
NEW WORK					
Guernsey Reservoir.....		800,000.00	800,000.00		
Spanish Springs.....	500,000				
Owyhee.....		315,000.00	315,000.00		
Valo.....	500,000				
Salt Lake Basin.....	900,000	375,000.00	375,000.00		
Yakima-Kittitas.....	375,000	375,000.00	375,000.00		
Umatilla Rapids.....		\$50,000.00			
Economic surveys.....		150,000.00		\$150,000.00	
MISCELLANEOUS ITEMS					
To pay Mary McConnell.....					289.00
Gaging streams, Milk River.....	10,000				
	9,999,000		2,011,500.00	150,000.00	486,289.00

<sup>1</sup> Carry over, unexpended balance fiscal year 1925, not to exceed \$125,000 (for Picacho Wash).

<sup>2</sup> Carry over, unexpended balance fiscal year 1925, not to exceed \$111,000 (Little Payette Lake storage).

<sup>3</sup> Available until Dec. 31, 1925.

<sup>4</sup> Amount is definite reappropriation from fiscal year 1925 (drainage construction), \$100,000.

<sup>5</sup> Appropriation was payable from general funds of Treasury. There remains unexpended Jan. 31, 1925, about \$200.

NOTE.—Final amounts of unexpended balances of appropriations shown in column 2 and not covered by explanatory footnotes, will be determined after June 30, 1925.

# RECLAMATION LEGISLATION

(Continued from page 55)

Subsec. L. That in any adjustment of water charges as provided in this section all due and unpaid charges to the United States, both on account of construction and on account of operation and maintenance, including interest and penalties, shall be added in each case to the total obligation of the water users, and the new total thus established shall then be the construction charge against the land in question.

Subsec. M. That every entryman or assignee on a project farm unit not yet patented which unit shall be found by the Secretary to be insufficient to support a family and pay water charges shall have the right upon application to exchange his entry for another farm unit of unentered public land on the same or another project located in the same State, in which event all instalments of construction charges theretofore paid on account of the relinquished farm unit shall be credited on account of the new farm unit taken in exchange: *Provided*, That where two entrymen apply for the same farm unit under the exchange provision of this subsection, only one of whom is an ex-service man, as defined by the joint resolution of January 21, 1922 (Forty-second Statutes, page 358), the ex-service man shall have a preference in making such exchange.

Subsec. N. That all contracts providing for new projects and new divisions of projects shall require that all operation and maintenance charge shall be payable in advance. In each case where the care, operation, and maintenance of a project or division of a project are transferred to the water users the contract shall require the payment of operation and maintenance charges in advance. That whenever an adjustment of water charges is made under this section the adjustment contract shall provide that thereafter all operation and maintenance charges shall be payable in advance.

Subsec. O. That the cost and expense after June 30, 1925, of the main office at Washington, District of Columbia, of the Bureau of Reclamation in the Department of the Interior, and the cost and expense of general investigations heretofore and hereafter authorized by the Secretary, shall be charged to the general reclamation fund and shall not be charged as a part of the construction or operation and maintenance cost payable by the water users under the projects.

Subsec. P. That where, in the opinion of the Secretary, a right of way or easement of any kind over public land is required in connection with a project the Secretary may reserve the same to the United States by filing in the General Land Office and in the appropriate local land office copies of an instrument giving a description of the right of way or easement and notice that the same is reserved to the United States for Federal irrigation purposes under this section, in which event entry for such land and the patent issued therefor shall be subject to the right of way or easement so described in such instrument; and reference to each such instrument shall be made in the appropriate tract books and also in the patent.

Subsec. Q. That where real property or any interest therein heretofore has been, or hereafter shall be, donated and conveyed to the United States for use in connection with a project, and the Secretary decides not to utilize the donation, he is authorized without charge to reconvey such property or any part thereof to the donating grantor, or to the heirs, successors, or assigns of such grantor.

Subsec. R. That there is hereby authorized to be appropriated from the General Treasury, the sum of \$100,000 for investigations to be made by the Secretary through the Bureau of Reclamation to obtain the necessary information to determine how arid and semiarid, swamp, and cut-over timberlands may best be developed.

Approved December 5, 1924.

## REAPPRAISAL OF PROJECTS

[Extract from first deficiency act, fiscal year 1925]

Reclamation fund, special fund: The following sum is appropriated out of the special fund in the Treasury of the United States, created by the act of June 17, 1902, and therein designated "the reclamation fund":

For carrying into effect the provisions of subsection K of section 4 of the second deficiency act, fiscal year 1924, approved December 5, 1924, to remain available until June 30, 1926, \$150,000: *Provided*, That the expenditures from this appropriation for each reclamation project shall be considered as supplemental to the appropriation for that project and shall be accounted for accordingly.

## THE YUMA MESA

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled*, That there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$200,000, to be paid out of the reclamation fund established by the act of June 17, 1902 (Thirty-second Statutes, page 388), for operation and maintenance and completion of construction of the irrigation system required to furnish water to all of the irrigable lands in part 1 of the Mesa division, otherwise known as the first Mesa unit of the Yuma auxiliary project, authorized by the act of January 25, 1917 (Thirty-ninth Statutes, page 868), as amended by the act of February 11, 1918 (Fortieth Statutes, page 437): *Provided*, That all moneys received by the United States in payment of land and water rights in said part 1 of the Mesa division, beginning one year from the date this act becomes effective, shall be covered into the reclamation fund until the sum advanced from said fund hereunder is fully paid: *Provided further*, That the purchase price of land and water rights hereafter sold in said part 1 of the Mesa division shall be paid to the United States in ten equal installments, the first of which shall be due and payable at the date of the purchase, and the remaining installments annually there-

after, with interest on deferred installments at the rate of 6 per centum per annum, payable annually; and the Secretary of the Interior is authorized, at any time within one year from the date this act becomes effective, to amend any existing uncompleted contract for the purchase of land and water rights so that the aggregate amount of principal and interest remaining unpaid under such contract may be paid in ten equal installments in accordance with the conditions of this proviso, beginning with the date of amendatory contract: *And provided further*, That land and water rights in said part 1 of the Mesa division heretofore or hereafter offered at public sale under said act of January 25, 1917, and not disposed of at such public sale may be sold later at private sale at not less than \$25 per acre for the land and at \$200 per acre for the water right.

Approved February 21, 1925.

[Extracts from the second deficiency act, fiscal year 1925]

## YUMA AUXILIARY PROJECT, ARIZONA

For operation and maintenance and completion of the irrigation system required to furnish water to all of the irrigable lands in part one of the Mesa division, otherwise known as the first Mesa unit of the Yuma auxiliary project, Arizona, in accordance with the provisions of the act entitled "An act to authorize the appropriation of certain amounts for the Yuma irrigation project, Arizona, and for other purposes," approved February 21, 1925, \$200,000, to be paid out of the "reclamation fund," to remain available during the fiscal year 1926, and to include the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1925.

\* \* \* \* \*

## PICACHO WASH

Not to exceed \$125,000 of the unexpended balance of appropriation for operation and maintenance, continuation of construction, and incidental operations in connection with the Yuma project, Arizona-California, contained in the Interior Department appropriation act for the fiscal year 1925, is continued and made available during the fiscal year 1926 for the continuation of construction of flood-protection works in the main canal near Picacho Wash.

\* \* \* \* \*

## BOISE PROJECT, IDAHO

Not exceeding \$111,000 of the appropriation of \$1,030,000 from the reclamation fund, special fund, for the Boise project, Idaho, for the fiscal year 1925, made by the Interior Department appropriation act, approved June 5, 1924, may be used for continued investigation, commencement of construction of additional storage, and incidental operations, to remain available during the fiscal year 1926.

\* \* \* \* \*

(Continued on page 57)



## COMMERCIAL POWER ON THE MINIDOKA PROJECT, 1924

*Electrical Assistant W. B. Clayton describes in nontechnical language the complex situation with regard to sliding scale and variable load factor, showing the cost of electric service to consumers on the project*

**F**ORTUNE has favored the Minidoka project in Southern Idaho in providing a surplus of electric power over the demands of the electric pumping division on the south side of Snake River, and the surplus has been put to beneficial use in various ways. During 1924, 7 towns, 20 rural companies and 38 individual consumers were served under a total of 65 contracts for electric light and power, and 15 contracts for electric heating were in effect.

The city of Burley, Idaho, having a population of about 5,000, had a total of 911 consumers for all classes of electric service and purchased 2,737,600 kilowatt-hours from the Bureau of Reclamation at a cost of \$32,573.14, or 1.2 cents per kilowatt-hour. The city stands all distribution losses and the costs of distribution including operation and maintenance of the system, depreciation, interest on bonds, renewals of equipment, etc., which adds greatly to the bare energy cost. The city sold this energy as shown by the following tabulation:

*Electrical energy distributed by the city of Burley*

	Kilowatt-hour sold	Gross revenue	Gross revenue per kilowatt-hour
			<i>Cents</i>
Lighting.....	583, 189	\$32, 282. 04	5. 5
Power.....	1, 047, 933	13, 215. 57	1. 26
Cooking.....	330, 839	8, 723. 00	2. 65
Water heating.....	470, 585	4, 093. 80	. 87
Total.....	2, 432, 546	58, 314. 41	

Small consumers pay a higher rate per kilowatt-hour than the larger consumers. Under existing lighting rates the small consumer is entitled to use 50 kilowatt-hours for a minimum payment of \$1.84 per month or 3.7 cents per kilowatt-hour. If he does not use his minimum, the unit cost is proportionately higher, of course. A larger consumer using 150 kilowatt-

hours per month pays \$4.14 monthly, or 2.8 cents per kilowatt-hour. Electric air heating has not been included in the above figures. Heat is purchased at the special rate of \$1.25 per kilowatt per month from the Bureau of Reclamation. A Burley heat consumer using 1 kilowatt of heat pays \$2.50 per month and a user of 10 kilowatts pays \$22.50 per month. A user of 50 kilowatts pays \$90 per month.

The 20 rural companies grouped together had 711 consumers, and purchased 527,936 kilowatt-hours during the year at a cost of \$10,622.87, or 2 cents per kilowatt-hour on the average. It should be understood that those companies making the most constant use of energy at high-load factor obtain the lowest unit price on purchased energy, as the standard rate schedule of the Minidoka project was purposely designed to encourage constant loads rather than fluctuating loads. A company or other user who uses his maximum demand only 50 hours a month pays 4 cents per kilowatt-hour. If the maximum demand is used 720 hours per month the rate drops to an average of 1.12 cents per kilowatt-hour. Both rates are subject to various discounts and additions. Complete records of energy sales and revenue as retailed by these mutual rural companies are not available for the group as a whole, but the records of the following four companies will be indicative:

	Number of consumers	Energy purchased		Energy sold		
		Kilowatt-hours	Cost	Kilowatt-hours	Revenue	Unit cost
Unity Light & Power Co.....	174	159, 280	\$2, 721. 92	99, 869	\$4, 876. 36	\$. 0488
East End Electric Co.....	81	53, 440	1, 047. 20	25, 697	1, 636. 90	. 0636
Riverside Electric Co.....	55	14, 100	1 370. 25	18, 976	1 628. 31	. 07
Acequia Electric Co.....	25	17, 420	473. 74	10, 541	871. 71	. 0827

<sup>1</sup> Six months' period.

### CANADA'S EX-SOLDIERS ASSISTED IN FARMING

A recent press dispatch from Ottawa, Canada, states that former soldiers of the Dominion's war-time armies to the number of 30,604 have been established on farms of their own, according to the report of the soldier-settlement board.

Of this total 24,143 have been granted loans, some as high as \$7,500 each, and the remainder have been given grants of Dominion land without loans. A total of

The conditions surrounding the retail rates of the rural mutual companies are somewhat different from those in the case of the towns. The individual farmer owns his own transformer whereas the city consumer does not. The farmer's membership in the company with his purchase of a share of stock provides the capital for constructing the distribution line. Some companies, like the first two in the above table, set their rates to members sufficiently high to provide a reserve fund to take care of replacing rotten poles. Other companies can make lower rates by omitting to make such a provision but when the poles begin to fail special assessments have to be levied against the members to finance these repairs. It must therefore be borne in mind that the above unit costs do not include the whole cost to the consumer.

There are 38 small consumers, fortunately located near existing lines belonging to the United States, who have been able to obtain electric service without forming a mutual company. These consumers furnish their own transformers also, but do not share in the distribution line costs, as these lines are maintained by the United States for some small pumping plant usually. This brings the unit cost lower than it would otherwise be. These small consumers purchased 16,129 kilowatt-hours at a cost of \$1,066.10, or 6.6 cents per kilowatt-hour.

\$103,150,098 has been spent for land, clearing, permanent improvements, and stock equipment. Veterans already have returned \$19,000,000 to the Government in repayment of principal and in interest on loans.

The majority of the soldier settlers have made good on the farm. Those who had no agricultural experience have been trained in special schools. Field supervisors of the soldier settlement board visit the veterans at intervals, superintend their farming operations, and give them practical help.

### PROJECT LEGISLATION

(Continued from page 56)

#### ORLAND PROJECT, CALIFORNIA

For continued investigations, purchase of rights of way, and incidental operations, \$50,000, to be paid out of the "reclamation fund" and to remain available until June 30, 1926.

\* \* \* \* \*

Approved March 4, 1925.



## PILOT BUTTE POWER PLANT, RIVERTON PROJECT

*Assistant Engineer Arthur Rueltgers describes the newly constructed hydroelectric power plant, which furnishes current for the operation of the electric drag lines used on canal and drain construction*

**D**ELIVERY of electric energy from the Pilot Butte power plant, the newly constructed hydroelectric plant on the Riverton project in Wyoming, was begun on January 8, 1925.

The source of power is a drop of 90 to 105 feet taken by the water in its diversion from the Wyoming Canal to the Pilot Butte Reservoir, an equalizing reservoir at the head of the Pilot Canal. The primary purpose of the plant is to generate current for the operation of electric drag lines to be used in the construction of main canals and drains for the balance of the project.

A penstock, power station, and tailrace make up the essential features of the plant.

The penstock consists of a 62-inch steel-lined, reinforced concrete, monolithic pipe, 920 feet long, with concrete intake and riveted-steel manifold. The intake, which is equipped with a cast-iron vertical gate, trash racks, sand sluice, and operating house, was not built as a separate structure but forms a part of a combined diversion structure at station 487 of the Wyoming Canal.

As constructed, the power station includes a complete substructure, superstructure, and switch yard for one unit of 800-kilowatt capacity, also an additional concrete draft tube for a proposed future second unit. Outside dimensions of the power house and adjacent switch yard are 26 by 41 feet and 13 by 35 feet respectively. The substructure is of reinforced concrete. Except for structural steel roof trusses, the superstructure is of framed timber with corrugated iron exterior and plaster-board interior. A

10-ton hand-operated overhead crane is provided for handling the machinery. The generating unit consists of a 1,000 Kv. a., 2,300-volt, 3-phase, 60-cycle vertical generator with direct connected exciter, driven by a 1,200 horsepower vertical-shaft, single-runner, spiral-case hydraulic turbine equipped with governor and synchronous relief valve.

To avoid expensive future enlargement, the tailrace was excavated for a full two-unit development. It consists essentially of an open channel about 450 feet long extending from the south wall of the power house to the edge of the reservoir, the upper 40 feet being lined with concrete to serve as a transition. A

check is provided at the end of this transition to maintain a water level sufficiently high to prevent breaking of the water column in the turbine draft tube.

Direct connection between the Wyoming Canal and the Pilot Butte Reservoir is furnished by a concrete wasteway which practically parallels the power penstock. Although this structure is not considered a part of the power plant, its use is indispensable in affording a by-pass and a means for disposal of sand, ice, etc.

Construction was begun in September, 1923, and completed early in January, 1925. All purchased materials and equipment were hauled by contract from Riverton, a distance of 26 miles. Sand and gravel were also hauled to the work by contract from a crushing and screening plant at station 295 of the Wyoming Canal, about 4 miles distant. Water was pumped from Pilot Butte Reservoir through a pipe line about three-fourths of a mile long.

The work was performed under the supervision of H. D. Comstock, project superintendent, with R. V. Sass in direct charge of construction.

Efforts of the new owners of the Fallon sugar factory, Newlands project, to interest the farmers in growing sugar beets this season were unsuccessful.

Activities to encourage the pickle business continued on the Belle Fourche project, and it is expected that salting stations will be erected on the project this year.

*The following State representatives on the board of survey and adjustments have been designated by the governors of the respective States and appointed by Secretary Work:*

*Colorado.—Barton O. Aylesworth, Fort Collins.*

*Idaho.—Warren G. Swendsen, Boise.*

*Montana.—I. D. O'Donnell, Billings.*

*Nevada.—George B. Thatcher, Reno.*

*New Mexico.—H. L. Kent, State College.*

*South Dakota.—B. F. Myers, Pierre.*

*Utah.—W. W. Armstrong, Salt Lake City.*

*Washington.—M. M. Moulton, Kennewick.*

*Wyoming.—A. J. Martin, Cody.*



Pilot Butte power plant. Left, transformer yard; penstock, gatehouse, and wasteway intake in background. Right, tailrace view

## DEVELOPMENT OF STATE SETTLEMENTS IN HUNGARY

*Settlers on State settlements pay the purchase price of the land within 50 years, and are charged interest at the rate of 4 per cent—Loans for stock and seed furnished*

STATE settlements are administered by the settlement bureau of the Royal Hungarian Treasury. There is no special department of the Government which is entrusted with the administration of other settlements. Applications for permits to reclaim and settle land are passed upon by the local authorities and then submitted to the Ministry of Agriculture for final approval.

The settlers on the State settlements are selected from the owners of small land holdings, agricultural laborers, and farm servants. There is a requirement of approximately \$800 capital, or the possession of the necessary farming implements. Settlers are further required to give a guaranty of \$300, and produce certificates showing that they have never been convicted of a crime.

The farm management on State settlements is under the personal supervision of an official delegated by the State, who furnishes all necessary advice and, during the winter months, gives lectures on practical farm management for the benefit of the settlers.

During the experimental period the State surveyed and divided the land and furnished the settlers with plans of the necessary buildings free of charge. State settlers and their families receive a special transportation allowance when moving from one place to another. Settlements consisting of 50 or more families are likewise exempted from the land tax for a period of six years, and settlements of less than 50, but not under 10 families, are exempted from this tax for a period of three years. To the State settlers is also given the privilege of beginning the payments on their land during the third year, and only the interest must be paid during the first two years.

The purchase price of the land is mutually agreed upon by private individuals. On the other hand, the State charges its cost price to the settlers. Both the State and private settlement organizers are obliged to turn over to the settlers all public buildings, including the church and the town lots necessary for the residences of the notary public, the priest, the school teacher, and the kindergarten teacher, as well as the area necessary for roads and highways. In addition, the founder of the settlement must transfer the land necessary for public purposes, as, cemetery, market place, school for forestry, etc., free of charge.

State settlers are furnished with advice and instruction by the settlement repre-

sentatives of the Treasury department, and agricultural journals and books are supplied gratis to the communities. During the winter lecture courses are given. There is also a model farm at every State settlement, the proprietor of which receives from the State the necessary amount of equipment free of interest and payable in easy installments.

State settlers receive further the amount necessary for the purchase of breeding stock, and this amount is free of interest and payable in installments over a period of four years. Sums necessary for the purchase of seed grain are likewise advanced for a period of one year, and without interest. Young fruit trees and grape shoots are distributed gratis.

The settlers on State settlements pay the purchase price within 50 years, and are charged interest at the rate of 4 per cent. Private settlers receive loans up to two-thirds of the appraised value of their property, from domestic financial institutions, while the proprietor of a settlement is obliged, upon request, to furnish a loan of \$160 at 5 per cent interest to any settler requesting it, and against the security of the settler's house.

On behalf of the State settlements, the State has subscribed to profit participating stock of the Hangya Cooperative Society, a society which buys and sells on a profit-sharing basis, and has erected on the settlements the buildings necessary to house the branch stores of this organization.

The members of State settlements are required to possess a minimum capital of \$800, as stated above. The capital requirements of private settlers are matters of mutual agreement between the parties concerned. State settlers are compelled to live on the settlement. In private settlements the matter of residence is determined by agreement. The initial cultivation on State settlements is done by the State either before the arrival of the settlers or during the period of settlement. The costs, however, must be borne by the settler, unless he can show good cause for exemption, in which case any costs incurred are charged to the national settlement fund. In private settlements this matter is also determined by mutual agreement.

The payment of the land or the repayment of loans may be specifically agreed upon, but the Minister of Agriculture, on the basis of the laws concerning settlements, may refuse to approve the agreement and refuse to grant the permit for

settlement. The interest on loans to State settlers is fixed at 4 per cent and in the case of private settlements a maximum of 5 per cent is prescribed. State settlers are granted the privilege of paying for their land or repaying loans within 50 years, and installments are begun in the third year. Only interest on the entire sum is payable during the first two years.

No free grants of land are made on State settlements. Patents or deeds are given after the payment of the first installment.

Conveying the property in private settlements is a matter of agreement. On a State settlement the holder may lease his land for a long term. This lease, however, may not be for a period of less than 50 years. At the request of a commonwealth, ecclesiastical foundation, entailed estate, or municipal corporation, the Minister of Agriculture may permit settlements on the holdings of these organizations, estates, etc., on a long-term lease basis. The lease in this case may, however, be for a period of less than 50 years.

A holding may be taken over on a basis of a long-term lease with a binding and clearly specified agreement or option of purchase, and this case is most frequently met with.

A settler on a State settlement may not transfer his holding to any person other than an immediate member of his family within a period of 15 years, under penalty of losing his right to it.

During the past five years there have been no appropriations for settlement matters, since settlements made under the law of 1894 were situated on areas which have been ceded to Rumania and Yugoslavia by the treaty of Trianon. There are but few towns or communities made up of these settlements in present Hungary. During the years preceding the war, State appropriations for settlement purposes amounted to \$200,000 annually.

A successful feeder will carefully watch his animals, observe the comparative results of different rations and systems of feeding, and will learn much through experience and experimentation on his own farm.

Feeders of hogs and poultry should provide plenty of variety in the ration, green feed whenever possible, and supplement the ration with dairy products, meat or fish scrap, or other feeds containing animal proteins.

## LOCAL COOPERATIVE BOARDS

IN accordance with instructions sent to the projects the latter part of January, local cooperative boards have been appointed to work in conjunction with the board of survey and adjustments, whose itinerary is given on another page of this issue. It will be recalled that the duties of the local cooperative boards are as follows:

1. To secure and supervise a classification of the lands of the project, according to regulations furnished.

2. To state briefly in writing all project matters now in dispute or that now need adjustment.

3. To collect and tabulate all available information relative to settlers' indebtedness, mortgages, delinquent taxes, and any other charges that must be met by the settlers now or in the near future.

4. To collect and classify all crop record data of the past 10 years or the years of record, by classes according to the land classification.

The boards, as a rule, comprise the superintendent and two water users, or one water user from each division. As the ERA goes to press information has been received of the appointment of the following water users on these boards:

*Grand Valley project, Colorado.*—R. A. Snodgrass and M. W. Blakslee, representing the Grand Valley Water Users' Association; Howard Lambeth, representing the Orchard Mesa irrigation district.

*Uncompahgre Valley project, Colorado.*—W. Guy Merritt, Delta, Frank Meaker, and John Howell, Montrose, Colorado.

*Boise project, Idaho.*—J. B. Newport, representing Black Canyon irrigation district, Notus; G. A. Remington, representing Nampa and Meridian irrigation district, Nampa; W. H. Kollenborn, representing one board of Payette-Boise Water Users' Association, Caldwell; L. J. Magee, representing one board of Payette-Boise Water Users' Association, Caldwell, Idaho.

*King Hill project, Idaho.*—Frank E. Wilson, Hammett; F. L. Kinkade, King Hill, Idaho.

*Minidoka project, Idaho.*—W. C. Paul, Rupert, representing the Minidoka irrigation district; W. L. Manning, Burley, representing the Burley irrigation district.

*Huntley project, Montana.*—C. E. Howe, Worden, Mont., Pryor division; O. P. Pesman, Pompeys Pillar, Mont., Fly Creek division; J. Kozeluh, Pompeys Pillar, Mont., eastern division.

*Sun River project, Montana.*—William Hanson, Fort Shaw, and C. W. Crabtree,

Simms, representing the Fort Shaw division; Earl G. Woods and Joseph Thorud, Fairfield, representing the Greenfields division.

*Lower Yellowstone project, Montana-North Dakota.*—Burton Adams, representing Lower Yellowstone irrigation district No. 1; S. J. Hardy, representing Lower Yellowstone irrigation district No. 2.

*Carlsbad project, New Mexico.*—Francis G. Tracy, Scott Etter, and John W. Lewis, Carlsbad, N. Mex.

*Umatilla project, Oregon.*—J. F. McNaught, Hermiston, representing the Hermiston irrigation district (east division); C. E. Glasgow, Irrigon, representing the West Extension irrigation district (west division).

*Belle Fourche project, South Dakota.*—G. W. Morsman, Nisland; C. E. Livingston, Newell, S. Dak.

*Strawberry Valley project, Utah.*—Karl F. Keeler, Strawberry High Line Canal Co.; and Alvin R. Creer, Spanish Fork South Irrigation Co.

*Okanogan project, Washington.*—John S. Petersen, Omak; R. C. Rasmussen, Okanogan, Wash.

*Yakima project, Washington.*—C. P. Wickersham, route 2, Yakima, and Clifford Kail, Tieton, representing the Tieton division; Sunnyside division; Clinton F. Price and T. A. Brashears, Outlook, representing the Outlook irrigation district; A. B. Delp and O. G. Patch, Sunnyside, representing the Snipes Mountain irrigation district; E. V. Heater and Frank Kinney, Grandview, representing the Grandview irrigation district; F. R. Anderson and A. E. Wilcox, Prosser, representing the Prosser irrigation district; S. J. Harrison, Sunnyside, and Arthur Johnson, Benton City, representing the Sunnyside irrigation district; George P. Eaton, Granger, and E. J. O'Brien, Outlook, representing the Granger irrigation district; F. E. Fyfe, Grandview, and E. C. Huston, Prosser, representing the Sunnyside Valley irrigation district.

*Shoshone project, Wyoming (Garland division).*—Earl Murray, Powell, Wyo; A. H. Glasgow, Powell, Wyo.

Not in five years has the United States presented so nearly a picture of balanced prosperity as it does now, declares A. B. Genung, agricultural economist for the United States Department of Agriculture. For the moment agriculture is swinging toward par, and the readjustment is a healthy one for the country.



One of twenty 5 feet by 5 feet cast-iron high-pressure outlet gates for American Falls Dam, Minidoka project, Idaho. These gates each weigh 62,000 pounds, or a total of about 1,250,000 pounds of castings. Contract was, executed with the Joshua Hendy Iron Works, of San Francisco, September 24, 1924, and delivery has recently been completed. Every gate was shipped ahead of the contract schedule, and final delivery was completed approximately 50 days ahead of the final delivery date fixed by the contract. Contract price was \$127,161.

## LAND CLASSIFICATION REPORTS

**T**HE following instructions concerning land classification maps and reports to be prepared by the local cooperative boards for the consideration of the board of survey and adjustments have been issued by Mr. Kreutzer, director of reclamation economics:

On some projects the land determined suitable for irrigation farming will be divided into less than four classes. Notwithstanding this fact, lands recommended for suspension shall be called class 5 lands and lands recommended for exclusion shall be called class 6 lands. One project classed its farm lands in first, second, and third class land. The land recommended for suspension would still be fifth class and land to be excluded sixth class. There would be no fourth-class land.

After the land classification is made by the classifiers, and approved by the local cooperative committee, six maps should be made on white prints and the farms colored thereon as follows: first class, red; second class, green; third class, blue; fourth class, yellow; fifth class, brown; sixth class, black.

Fifth and sixth class lands shall be delineated on each farm unit on the map, but the remaining portion of each farm shall be shown as one class.

A brief report on the land classification shall be prepared by the local cooperative committee, in which shall be given a list of the personnel used, the time the work started and when completed. A brief description should be given of each class of agricultural land with a discussion of crop adaptability and approximate crop yields. The discussion of class 5 and 6 lands should enumerate quite fully the physical disabilities of the lands in question, such as, unfavorable topography, thin soils, stony land, hard pan, alkali, high-water table, etc. A table should be inserted showing the number of farms and the total area of such farms in each class. Six of these reports, with land classification maps, should be made and signed by the local cooperative committee, two of which should be sent to the commissioner, one to the Denver office, one to the advisory adjustment board, and the remaining copies should be kept at the project office.

Crop records should be compiled and recorded in the report for the 10 years of record, including 1924, or for the years of record, if less than 10 years, for each class of land. If the advisory adjustment

board reaches a project before the crop data can be assembled, a later report can be submitted.

### SECRETARY WORK LEAVES FOR WEST

*Plans have been completed for an official trip of Secretary of the Interior Work to western States to examine into reclamation, national park, and Indian reservation problems in the Interior Department.*

*Secretary Work left Washington on March 18, and will be absent about a month. He was accompanied by Commissioner Mead, of the Bureau of Reclamation, and Director Mather, of the National Park Service.*

*During the trip irrigation possibilities, flood control, and power development on the lower Colorado River, which has been a subject of investigation for 75 years, will be inspected. Secretary Work and his party will make a short journey into Mexico examining levees and canals now providing water for the irrigation of the Imperial Valley and will also look over the site for the proposed all-American canal in southern California.*

*The Secretary's itinerary includes two national parks and nine reclamation projects and Indian reservations. The national parks to be visited are the Sequoia National Park and the Yosemite National Park, both located in California.*

*On the trip to Federal reclamation projects, Secretary Work will meet with the water users and settlers, obtaining first-hand information concerning conditions existing on them.*

*The reappraisal of Government reclamation projects, the work of which is now being prosecuted by a special board, will also be checked up.*

*The projects on the itinerary include: Carlsbad project in New Mexico; Rio Grande project in New Mexico-Texas; Yuma and Yuma-Mesa project in Arizona-California; Klamath project in Oregon-California; Orland project in California; Newlands project in Nevada; Grand Valley and Uncompahgre projects in Colorado; and North Platte project in Nebraska-Wyoming.*

## DATES ON WHICH BOARD WILL VISIT PROJECTS

The itinerary of the committee of the board of survey and adjustments of which Ex-Governor Campbell is chairman follows: Rio Grande project in New Mexico-Texas, from March 12 to 17; Carlsbad project in New Mexico, from March 18 to 22; Grand Valley project in Colorado, from March 24 to 31; Belle Fourche project in South Dakota, from April 28 to May 5; Okanogan project in Washington, from May 7 to 11; Yakima project in Washington, from May 12 to 22; Klamath project in Oregon and California, from May 24 to 31; Strawberry Valley project in Utah, June 15.

The itinerary of the committee of the board of survey and adjustments, of which Doctor Widtsoe is chairman, is as follows: Boise project in Idaho, from March 5 to 10; Minidoka project in Idaho, from March 12 to 17; King Hill project in Idaho, from March 18 to 25; Umatilla project in Oregon, from March 26 to 31; Huntley project in Montana, from April 27 to May 1; Lower Yellowstone project in Montana and North Dakota, from May 4 to 11; Milk River project in Montana, from May 12 to 19; Sun River project in Montana, from May 21 to 28.

The joint board with the full membership will conduct the survey of the following projects: Uncompahgre project in Colorado, from April 2 to 9; North Platte project in Nebraska and Wyoming, from April 11 to 18; Shoshone project in Wyoming, from April 19 to 26; Newlands project in Nevada, from June 3 to 12.

These dates will be followed unless some unforeseen circumstance makes a change desirable.

The following projects have not asked for adjustments: Salt River project in Arizona; Yuma project in Arizona and California; Orland project in California; Williston project in North Dakota; and Riverton project in Wyoming.

Dairying and diversified farming are one and the same. Diversified farming produces a variety of crops for market; a failure of any one or two does not mean bankruptcy for the farmer. The dairyman does not have all his eggs in one basket.

Farming, no matter how profitable, never reaches the position of dignity which is its heritage until the farm home becomes so attractive that it is the greatest pride of the entire family—something to be handed down from generation to generation.



## COLONEL FLY'S "BELOVED YUMA MESA"

THE culmination of Col. Ben. Franklin Fly's efforts in behalf of the Yuma Mesa came recently with the passage of two acts of Congress, authorizing the appropriation of and appropriating \$200,000 for operation and maintenance and completion of the irrigation system required to furnish water to all the irrigable lands in part 1 of the Mesa division.

Colonel Fly became interested in the

development of the Mesa nine years ago, and has worked whole-heartedly and tirelessly in the interest of this frost-free citrus fruit garden spot of the Southwest. During this period Colonel Fly's enthusiasm over the possibilities of the Mesa never waned. The accompanying illustration shows him in various rôles in connection with the progress of the work.

It has long been demonstrated that the Mesa is perfectly adapted to the culture of oranges, grapefruit, dates, and grapes. The Mesa grapefruit ripens early and enjoys high prices.

Colonel Fly has been coming to Washington so often and for so many years that he seems like one of the "family" in reclamation headquarters, and he is always welcome because he is full of enthusiasm, a great friend of reclamation in general, and never seems to tire of telling about the wonders of his favored section of the country. He likes to refer to himself as the "Daddy of the Yuma Mesa."

## UNIFORMITY IN PERSONNEL MATTERS

SECRETARY WORK has issued the following self-explanatory order under date of March 9, 1925:

"Personnel matters should receive closer attention from administrative officers of the department. Without an efficient personnel we can not hope to operate successfully, and without a satisfied personnel we can not expect efficiency.

"Uniformity in handling personnel matters in the department is necessary to protect the rights and interests of the Government and employees alike. Dissatisfaction has been created in the past by differing standards for promotion in the several bureaus and by too great a liberality in distributing increases in salary in those bureaus that have been more fortunate than others in securing generous appropriations.

"Efficiency and economy are each necessary to the other, and due regard must be given to the economical administration of the Government's business.

"It does not contribute to good service for bureau officers to recommend increases in salaries which the Secretary can not properly approve, for administrative reasons. The Secretary must necessarily consider comparable conditions and salaries throughout the department and follow a policy applicable to all bureaus alike.

"Promotions should not be made simply because a bureau happens to have surplus funds available. Merit and the good of the service must control. The present line-up of positions and salaries is considered the standard, and promotions as a rule should be made only when vacancies occur. New salary rates or new positions must not be created without full justification. A contrary policy, carried on for a prolonged period, would result in an unwarranted high average salary list.

"The promotion of employees to meet competition in private enterprise should not be given as a justification for an increase in salary. The department endeavors to compensate employees at rates commensurate with the duties performed, and no employee should be considered so indispensable as to interfere with his personal advancement elsewhere.

"Since promotions are based on individual qualifications and efficiency, stereotyped phraseology should be avoided in framing justifications. The Secretary is entitled to know in what particular the employee excels and the reasons for recognizing him should be so outstanding that there need be no difficulty in stating them specifically rather than in general language.

"In addition to the regular justification, bureau officers should specify that the particular employee is the one best entitled to an increase of salary, that a deficiency will not be created, and, in the District of Columbia, that the recommendation conforms to the current efficiency ratings.

"Promotions of more than one step can not be considered.

"Selecting employees in the higher grades for promotion in preference to those in lower grades where the standards of efficiency are comparable should be discontinued.

"Employees about to be transferred to new duties should not be promoted in advance of actually taking over the new work, nor should a promotion be made under a new assignment before the employee has demonstrated his ability to handle the job.

"A redistribution of the work and its absorption by other employees can usually be made when a vacancy occurs. The

object to be attained is a reduction in the salary roll and a gradual increase in the standards of efficiency, character, and qualifications of the employees of the department, with encouragement and increased earnings to the individual.

"Reallocation, ostensibly from change of status involving a new assignment of work, but actually prompted by a desire to increase salaries, is not justifiable. Employees should not be recommended for reallocation unless there has been a material change of duties due to rearrangement of work, or to fill a vacancy which involves the actual taking over of the duties of the position. Heads of bureaus should give their personal attention to such reallocations, and the job description should show unmistakable change in duties. The Secretary should not be expected to give his approval to recommendations for reallocation to a higher grade for the purpose of promotion only.

"HUBERT WORK,  
Secretary."

## LIVESTOCK INTERESTS CENTER IN DAIRY COW

Where the acre yield is smallest the use of livestock as a manufacturing agency is of greatest importance. It is indispensable that on lands of a low productive capacity animal husbandry be developed intensively. Probably this may in part explain the fact that in northern regions, where the soils are somewhat less productive and the climatic environment less favorable, a larger proportion of livestock is maintained on the farm. When farm animals are considered with these thoughts in mind, the dairy cow always becomes the center of consideration.

Large tracts of land on the Rio Grande project are being subdivided to accommodate new settlers who are locating in large numbers on the project.





## COLONEL FLY'S BELOVED YUMA MESA

1. Colonel Fly digging the first shovelful of earth for the foundation of the pumping plant. 2. Colonel Fly receiving the order for the sale of the land on December 10, 1919. 3. Colonel Fly selling the first lot of Yuma Mesa land, December 10, 1919. 4. Colonel Fly setting the first bench mark. 5. The interior Department building. 6. The first water being pumped. 7. Mrs. B. F. Fly (right) and her mother feeding pigeons on the mesa. 8. Colonel Fly planting the first orange tree on unit B, May 24, 1922. 9. The pumping plant under construction. 10. Former Secretary Lane authorizing the opening of Yuma Mesa. 11. Colonel and Mrs. B. F. Fly at their home on the mesa. 12. Four-year old grapefruit tree on the mesa. 13. Colonel Fly delivering Yuma Mesa grapefruit to the President at the White House. 14. The White House. 15. Young grapefruit and orange trees on the Yuma Mesa.



East Park Dam, Orland project, California

## SACRAMENTO VALLEY SURVEYS CONTINUE

An additional expenditure of \$30,000 has been made available to continue the investigation to determine the feasibility of shutting off the flow of salt water, due to tidal action, up the Lower Sacramento and San Joaquin Rivers in California by means of a dam at Carquinez Straits.

Under a contract signed by the Secretary of the Interior and the California Department of Engineering and Irrigation, the State will contribute \$15,000 to continue the investigation, and the Bureau of Reclamation will put up a similar amount.

It has been shown that satisfactory foundations for such a dam can be secured. The continuance is to make the survey, and to prepare the plans and estimates for navigation locks. If regulation by this means is not feasible, litigation to restrict the use of water in irrigation on both rivers, now temporarily suspended, will be resumed by irrigators and property owners in the delta of these two rivers. On the other hand, if such regulation is feasible, it will permit practically the complete use in irrigation of the water of both streams, and a lessening of the uncertainty as to what can be done in the dry season.

Up to this time approximately \$50,000 has been expended on the investigation.

## FRANCIS M. GOODWIN APPOINTED ON BOARD

Francis M. Goodwin, Assistant Secretary of the Interior, has been appointed by Secretary Work as a member of the board to review and reappraise Federal reclamation projects. Selection of Mr. Goodwin was due to his wide experience and extensive knowledge of irrigation problems and his thorough familiarity with the Northwest.

Mr. Goodwin has been Assistant Secretary of the Interior during the past four years. During this time he acted as chairman of the commission investigating the proposed Columbia Basin project in the State of Washington, having charge of the engineering, agricultural, and economical surveys made for the purpose of submitting a report to Congress on the feasibility of this immense irrigation undertaking. He will continue as head of this commission until its work is finished and its conclusions are finally sent to Congress.

In addition, Mr. Goodwin has had wide experience in public land and reclamation matters previous to his being appointed Assistant Secretary of the Interior. In 1901 he was named special agent of the General Land Office, being later promoted to chief of field division upon the reorganization of the field force and the establishment of field division offices.

In 1907 Mr. Goodwin resigned as chief of the field division of the General Land Office and was appointed as Special Assistant Attorney General. On retiring to private life he took up the practice of law at Spokane, Wash. His activity in the legal

profession brought him in touch with important litigation dealing with irrigation, reclamation, public lands, and power sites.

The board of review and appraisal of Federal reclamation projects of which Mr. Goodwin has been made a member, will visit practically all the projects in the West, examining into questions connecting with their reappraisal before making a final report to Congress at its next term.



Wasteway on the Interstate Canal, North Platte project, Nebraska-Wyoming

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

D. W. Davis, Director of Finance.

P. W. Dent, Assistant to the Commissioner

C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant

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Board of Survey and Adjustments

Thomas E. Campbell, Chairman Southern Division

John A. Widsøe, Chairman Northern Division

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Younghlutt.....	R. C. Walber.....		Brooks Fullerton.....	Mitchell, Nebr.
Boise.....	Boise, Idaho.....	J. B. Bond.....	E. R. Mills.....	C. F. Weinkauff.....	B. E. Stoutemyer.....	Boise, Idaho.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	V. L. Minter.....	V. L. Minter.....	Ottamar Hamele <sup>1</sup> .....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	S. O. Harper.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	A. R. McGinness.....	J. P. Stebeneicher.....	Miss M. C. Simek.....	E. E. Roddis.....	Billings, Mont.
King Hill.....	King Hill, Idaho.....	G. H. Harris.....	E. V. Hillius.....	E. V. Hillius.....	B. E. Stoutemyer.....	Boise, Idaho.
Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. O. Wheeler.....	G. R. Barnhart.....	H. L. Holgate.....	Portland, Oreg.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....	E. E. Roddis.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	G. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	H. W. Bashore.....	L. H. Mong.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. O. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	Ottamar Hamele <sup>1</sup> .....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	V. E. Hubbell.....	Brooks Fullerton.....	Mitchell, Nebr.
Salt River <sup>2</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>3</sup> .....				
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	W. C. Berger.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	G. C. Patterson.....	C. M. Voyer.....	H. L. Holgate.....	Portland, Oreg.
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Williston.....	Williston, N. Dak.....	W. S. Arthur.....	W. S. Arthur.....	H. C. Melaas.....	E. E. Roddis.....	Billings, Mont.
Yakima.....	Yakima, Wash.....	J. L. Lytal.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	C. A. Denman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

### Large Construction Work

Minidoka, American Falls	American Falls, Idaho.	F. A. Banks <sup>4</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>5</sup> .....	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.
Yakima, Tieton Dam	Rimrock, Wash.....	Walter Ward <sup>4</sup> .....	M. J. Gorman.....	C. F. Williams.....	do.....	Do.

<sup>1</sup> Attorney.

<sup>2</sup> Project operated by Salt River Valley Water Users' Association.

<sup>3</sup> General Superintendent and Chief Engineer.

<sup>4</sup> Construction Engineer

<sup>5</sup> Superintendent of Construction.

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*THERE can be no doubt about the successful outcome of the Federal experiments in reclamation by irrigation if the experience now gained be applied to existing and coming projects. It is of the greatest importance to the stability of the country that the great work of reclamation and home making on the land continue. We must maintain the equilibrium between the urban and rural life to perpetuate and continue that splendid American institution—the farm home, the anchor of the Republic in every hour of stress and storm and strife.*

*—From a speech by Hon. Charles L. McNary  
in the United States Senate  
March 18, 1925*



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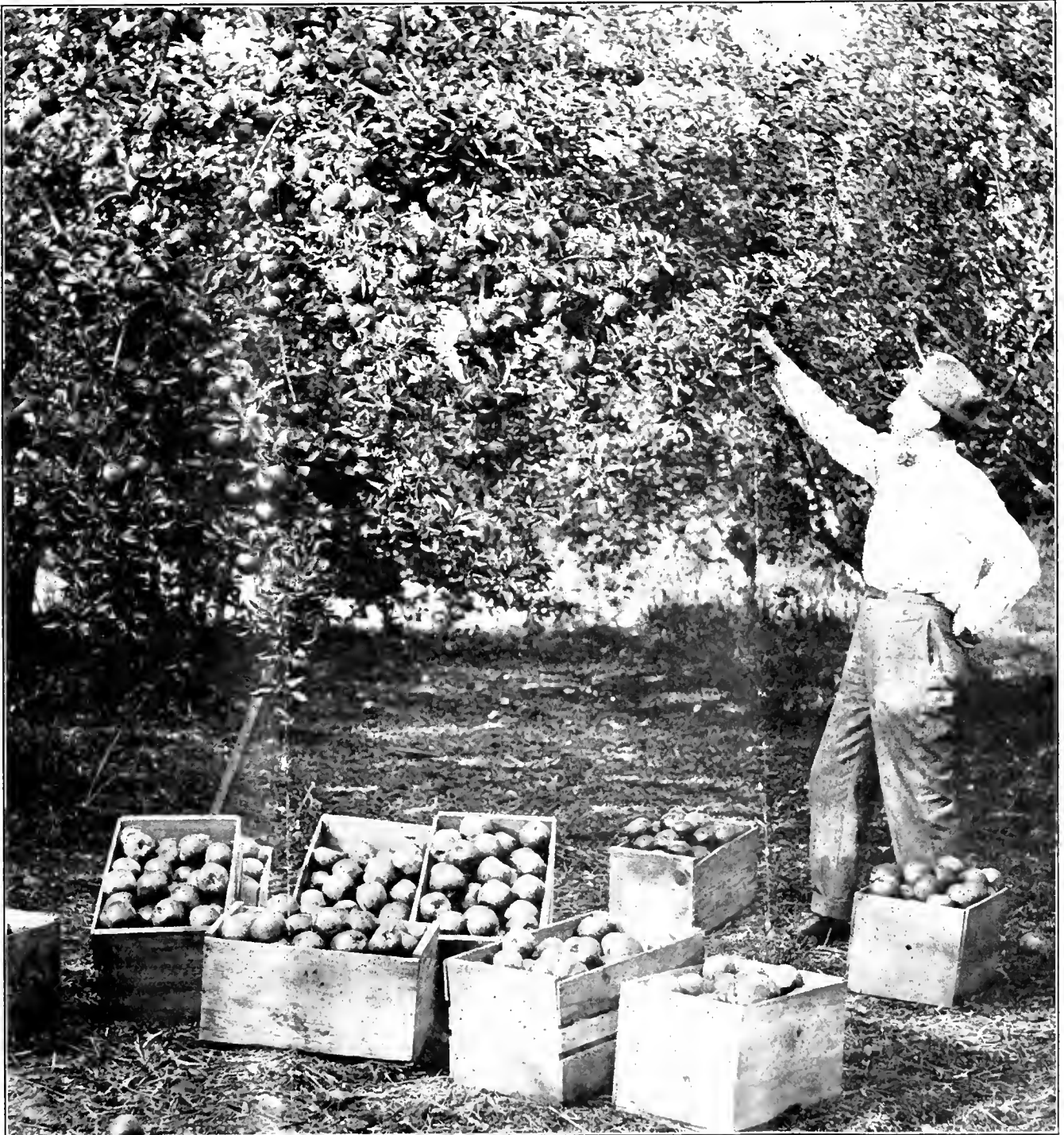
Feb 21 1925  
Kansas City, Mo.

# NEW RECLAMATION ERA

VOL. 16

MAY, 1925

NO. 5



YAKIMA APPLES

The gross value of this crop on the Yakima project, Washington, amounts to several millions of dollars annually



*FARMING is a highly competitive business. The efficient farmer will succeed; the inefficient farmer will ultimately fail. Sound business methods applied to farming will increase and stabilize the farm income and elevate the standard of living on the farm. A well-balanced and efficient agriculture which supplies an even and dependable flow of products for which there is an effective demand will benefit both producer and consumer.*

*HON. W. M. JARDINE,  
Secretary of Agriculture.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

MAY, 1925

No. 5

## SECRETARY WORK AND DOCTOR MEAD DISCUSS RECLAMATION

*Meeting at Chico., Calif., provides opportunity to point out present policies regarding the future development of irrigation projects based on the new reclamation legislation*

**S**PEAKING before the Rotary Club of Chico, Calif., on April 8, Secretary Work is quoted in the Chico Daily Enterprise as emphasizing the success that has attended the Durham colonization project, which was begun and developed by Doctor Mead, and stating that this is the focus from which similar schemes should radiate. The Secretary stated that the Department of the Interior had inaugurated a new policy of Federal reclamation which is not content merely with the construction of a dam or an engineer's scheme.

"The first purpose of reclamation is to furnish homes for farmers in the semiarid regions," he is quoted as saying. "I bring a message of hope, rather than of discouragement, in regard to reclamation of arid lands, whether it be by Federal authority or by private activity. I am hopeful because we have seen and profited by the mistakes of the past. I think this little colony here of Durham in this beautiful valley will in time be known as the pioneer center of a new policy of settlement which will make Federal reclamation a success."

Doctor Mead is quoted in the same paper as follows:

"I was asked to-night to tell you something definite about the reclamation policy and procedure which has to be adopted in the creation of new projects under the legislation passed last year. That legislation made a very radical change in the procedure, and those changes may not be fully understood.

"The attitude of our department is not favorable to new irrigation projects, because of the fact that in the past there has been pressure in Congress to have new areas taken under this policy before the old areas are taken care of. We have a large number of unfinished projects. It is the policy of the Secretary of the Interior, and it is the only wise policy that can be adopted, to complete those projects before any new projects are begun.

"If that is carried out strictly it means no new projects will be adopted for the next 10 years. It will take all the revenue

that can possibly come into the fund to complete those already established.

"If there are to be any exceptions to that, I think it will be as to projects of the character of this one you are interested in—projects that are small in area, and small in the amount of money that is involved. I am quite sure that policy will not be departed from for some time at least, except for projects of this character—small projects that will not make serious inroads on the fund.

"If this project proves of such a character that it will warrant a departure from that general rule, then these steps will have to be taken: First of all, the boundaries will have to be fixed; then there will have to be some kind of organization of the area that will assure the repayment of the money to be expended by the Government. This is going to be watched by Congress more carefully in the future than it has been in the past. The form of organization that is definitely preferred by Congress, and has been stipulated as to all projects adopted in the last two years, is that of a district. A district organization affords the greatest assurance

of repayment of the money that is due, because it is collected by an agency outside the Government and is not subject to influence to secure deferred payments.

"The next thing is that where there is land in private ownership, before any money is expended, the price at which such privately owned land shall be sold in areas in excess of 160 acres shall be fixed under agreement with the Secretary of the Interior. Such a stipulation is in the last appropriation bill, and it probably will be stipulated in future bills. That is done to stop one of the very serious reproaches and blemishes on the operation of the act in the past. There has been a tendency to capitalize the generosity of the Government; to sell land at an inflated price to the unwary settler, so that he has had to pay for the improvements twice—once through the inflated price at which the land was sold, and next in the obligation to repay the Government for its work. That must not be done again. If an agreement as to price can not be reached, then the irrigation will not be commenced.

"The next question is: Is there any reason why the people who own this land should desire a Government undertaking? I think there is. I think that under the new legislation provided for the new projects for which appropriations have been made this year, it is assured that there will be some consideration for the settlers; some organization to enable them to work together, to know each other, to have community life such as has characterized the development at Durham. The terms of payment for reclamation work under the act are more favorable than can be given if the work is carried out strictly as a business enterprise. Under the act as it is now, under any new project, the cost of the work is repaid out of the earnings of the land. The payment each year is to be 5 per cent of the average gross returns from the crops. The yearly repayment is not influenced by the cost of the work; it depends entirely on the revenue derived from the irrigation and cultivation of the land."

## STATE COOPERATION IN RECLAMATION WORK

Whereas the Federal Government in the act passed by the last Congress appropriating funds for the Interior Department indicated its purpose to require State cooperation in the matter of land settlement in connection with further reclamation development; and

Whereas it is believed that such a requirement will benefit all interests concerned, the Federal Government, the State, and reclamation project itself; therefore, be it

*Resolved*, That the Seattle Chamber of Commerce declares itself as being in hearty accord with the policy of State and Federal cooperation in respect to land reclamation and favors any suitable additional legislation that may be required to make such cooperation effective.

## ECONOMIC PHASES OF THE VALE PROJECT, OREGON

*Committee of economic experts concludes that under certain conditions relative to land classification and repayment on production basis, the project is feasible and desirable*

### INTRODUCTION

**LOCATION.**—The proposed Vale project comprises lands in Malheur County, Oreg., adjacent to the low valley lands on the Malheur River bottom, largely surrounding the town of Vale. These uplands, together with the lowlands now within the Warmspring Irrigation District, composed what was formerly called the Malheur project, on which investigations were begun some 20 years ago. Engineering studies of these arid uplands made during the last two years have referred to the area both as Malheur project lands and Warmspring lands. It is now proposed to term the area under consideration Vale project. The irrigation district which is being formed to include the Vale project will be known as the Vale Oregon Irrigation District.

Investigations forming the basis of this report were made at the request of the Division of Reclamation Economics, Bureau of Reclamation. The committee selected to make the investigations consisted of W. W. McLaughlin, irrigation engineer, United States Department of Agriculture, Berkeley, Calif.; G. H. Hogue, assistant engineer, Bureau of Reclamation, Boise, Idaho, and Prof. W. L. Powers, soil technologist, Oregon Agricultural College, Corvallis, Oreg. This committee was assisted by a locally appointed committee from the Vale district consisting of Ralph Holt, Richard de Armond, and Judge D. Biggs, and also by the county assessor of Malheur County, Andrew M. Graham.

The object of the investigation was to determine the agricultural and economic phases of the Vale project and to report to the Bureau of Reclamation the recommendations and conclusions of the committee. The gathering of field data was commenced about the middle of August and completed September 1, 1924.

The committee made use of various reports which had been previously submitted covering various phases of this project. A cooperative report by the State of Oregon and United States Reclamation Service entitled "Malheur and Owyhee projects," published in 1916, contains a digest of this information up to that date. The United States Reclamation Service has since prepared engineering reports covering the Vale project, having included in these reports a preliminary soil survey by Professor Powers and a completed soil survey by H. H. Krusekopf, of the Bureau of Soils, United States Department of Agriculture.

Pertinent local data were furnished by County Agricultural Agent L. R. Briethaupt, of Ontario, and by Charles L. Batchelder, engineer and manager of the Warmspring Irrigation District at Vale.

The scope of the work included a soil survey and land classification, a study of drainage conditions and water requirements, a collection of data as to yields of the various crops grown in this region, a study of meteorological factors having agricultural or economic importance, as well as transportation facilities and rates, markets and market conditions, and a survey of the school situation, taxation, and such other factors as would be necessary in determining the economic feasibility of the proposed project when based upon the provisions of the fact finders act.

### CONCLUSIONS

1. The lands selected for the Vale (Oregon) project are mainly sagebrush benches between Jamieson and Malheur Canyon and Harper bench. Supplemental water is provided for 3,570 acres of alluvial wild meadow. The total area is 28,350 acres classified as follows:

2. Class A, 13,960 acres at \$145 construction charge, including drainage; class B, 11,370 acres at \$115; class C, 3,020 acres at \$85.

3. Class A is almost level sagebrush bench land, very desirable for irrigation, both as to surface and soil conditions.

4. Class B includes mainly sagebrush bench land that is fairly suitable for irrigation, but having a more rolling surface or more remote location or imperfect drainage. This class includes meadow lands requiring supplemental water equivalent to the requirement of 3,570 acres of arid land.

5. Class C lands can be irrigated, but are less desirable than class B due to broken topography, retarded drainage, or to some alkali.

6. Class D includes eliminations as high, broken, stony land and hard alkali land called greasewood land.

7. The average cost is \$126.50 per acre to irrigate 28,350 acres comprising classes A, B, and C. The bench land is almost free from alkali and has comparatively good natural drainage.

8. Foothill drains will be required below the bench, and some drainage will be needed in the wild meadow lands if tame grasses and legumes are to be grown. The amount estimated for drainage is \$185,000.

9. The soil is generally of good depth. The compact subsoil of the bench lands

softens under irrigation. It has good water capacity and is well supplied with mineral nutrients.

10. The quantity of water necessary to properly irrigate this acreage has been stored as available surplus annually for some years past in the Warmspring Reservoir.

11. Preliminary surveys and designs have been made for canals and structures to convey the necessary water for the proper irrigation of these lands. The estimated cost of the system complete, including purchase of storage in Warmspring Reservoir and the construction of drainage system, is \$3,587,305.

12. A duty of water of 3 acre-feet per acre, delivered at the land, is considered ample.

13. It is assumed that the Warmspring Irrigation District will be able to establish a clear title to the land occupied by the Warmspring Reservoir.

14. Climate, soil, market, and transportation conditions warrant for this section a high type of agriculture.

15. Stock raising, with dairy cattle as a basis, and hogs, poultry and sheep to supplement, will form a basis for one of the major activities. The feeding of beef cattle on meadow lands will continue to be an industry. Conditions are favorable for growing fruits and berries for home use.

16. The cash-crop farmer will find a lucrative field in the growing of clover seed, alfalfa seed, hay, corn, potatoes, lettuce, beans, cereals, and other staple crops.

17. Under such types of farming as enumerated the estimated average return per acre will be \$37.50. Hence it would take about 67 years to pay out the construction after payments begin. Estimated returns are based on the following per acre yields:

Alfalfa hay	.....	tons	4.5
Wheat	.....	bushels	35
Barley	.....	do	50
Corn	.....	do	45
Clover seed	.....	do	4.5
Potatoes	.....	do	225
Beans	.....	do	15

Other crops in proportion.

18. The size of the units should vary from 20 acres to 80 acres for intensive farming, and not to exceed 160 acres for the limited area of meadow land suitable for cattle feeding only.

19. The development of this area will require approximately 500 settlers.

20. The preparation of land for irriga-

tion, including farm ditches, will vary from \$10 to \$30 per acre.

21. A 40-acre dairy unit, fully developed and equipped, will cost about \$7,500 from sagebrush to a fully-developed farm.

22. A good settler with \$5,000 capital and a loan of \$2,000 from the land bank during the second year will have a solvent undertaking.

23. A settler with \$2,500 capital will have great difficulty without assistance other than is now provided.

24. A settler with \$2,500 taking a farm all cleared and one-half planted to perennial legumes can succeed with the aid of the land bank.

25. Very little, if any, of the land having no water right is mortgaged.

26. The tax rate of Malheur County for 1923 averaged, for farm lands, about 31 mills, based on an assessed value of improved lands at \$70 per acre, which is approximately 45 per cent of their market value.

27. All but about 15 per cent of the land is in private ownership; 38 per cent of the land is owned by two companies; 15 per cent of the land is owned by 15 individuals; 20 per cent is owned by 39 claimants; 7 per cent is owned by 30 persons.

28. Seventy-five per cent of the land which is held in private ownership would have to be subdivided under the terms of the reclamation act, and this, with the 15 per cent of Government land, would give at least 90 per cent of the total area requiring subdivision.

29. The privately owned land, exclusive of that now having a partial water right, could probably be purchased at \$5 to \$7.50 per acre. It is, however, generally understood that a large majority of the owners, including the owner of the largest tract, will dispose of their holdings in such units and at such prices as may be designated by the Secretary of the Interior. There are on file in the Boise office of the Bureau of Reclamation numerous letters signifying the willingness of landowners to agree to these terms.

#### RECOMMENDATIONS

30. Your committee recommends:

(a) That contract for purchase of storage water be drawn so as to protect the Bureau of Reclamation from contributing damages due to seepage from bench lands in consideration of foothill drains constructed for Warmspring Irrigation District.

(b) That the same contract stipulate the amount that shall be expended in the form of drainage for land of the Warmspring Irrigation District, which amount shall apply on the purchase of storage.

(c) That the Bureau of Reclamation file on waste water rising from irrigation of bench lands by the bureau's canals so that a charge may be made by the proposed Vale Oregon Irrigation District for drainage provided by foothill drains, particularly on Willow Creek, and that return waters may be available for partial irrigation of pasture.

(d) That long-time credit be extended to new settlers.

(e) That a competent agriculturist be employed to aid and assist the settlers.

(f) That the Secretary of the Interior fix the prices at which excess holdings are to be disposed of to settlers.

(g) That provision be made for clearing and preparing a portion of each farm unit by the Bureau of Reclamation prior to settlement.

(h) That settlers be selected in accordance with their experience, capital, and other desirable characteristics.

(i) That one irrigation district be formed to include all the lands in the proposed project.

The committee concludes, on the basis of the above facts and recommendations and under the proposed law providing for classification of land and for repayment of construction charges at the rate of 5 per cent of the gross annual returns, and in view of the relief which would be afforded to, and is an imperative and immediate need of the Warmspring Irrigation District, that the project is feasible and desirable.

W. W. McLAUGHLIN,  
*Irrigation Engineer.*

G. H. HOGUE,  
*Assistant Engineer.*

W. L. POWERS,  
*Soil Technologist.*

#### LOCAL INDORSEMENT

We have carefully reviewed the conclusions and recommendations of the committee on the Vale project and we respectfully submit the following:

We think that the committee is conservative in section 17 of its conclusions in the estimated average return per acre, especially on the yield of alfalfa hay, corn, and potatoes. These yields will be higher most years. The average gross annual return estimate of \$37.50 appears a fair figure based on present prices for farm commodities, but this figure should be materially increased as years go on and the land is brought into a high state of cultivation and production. We estimate that the settlers should be able to repay the Government the construction cost within 60 years.

We recommend farm units from 20 to 80 acres. On the small units fruits can be raised along with dairy cattle, hogs, and poultry, especially near the Jamieson end

of the project, which is a proven fruit section. Most of the farm units should be about 40 acres and ranging up to 80 acres for intensive farming. Dairying should be the chief industry. The basic crops should be alfalfa and clover hay, with dairy cattle, sheep, and hogs sufficient to consume practically all the forage crops raised. Alfalfa and clover seed are both good cash crops. Corn, potatoes, and small grains can be produced profitably as rotation crops following alfalfa or clover. Inasmuch as this project is surrounded by a large acreage of range country suitable for grazing livestock, we believe the running of range stock would be profitable, and to care for this industry some of the farm units should be as large as 160 acres.

It is difficult to determine the price of raw land in the Vale project, as few sales are being made. The sales indicate a price of \$5 to \$20 per acre, and these prices appear to us as about the real value for colonization purposes with due consideration given for location, quality of soil, etc. The colonization of these lands should be safeguarded from speculation by the Secretary of the Interior fixing the size of the farm unit and the sale price and requiring that all excess holdings be offered for sale immediately after water is available. A large number of landowners have already signified their willingness to do this by letters which are now on file in the office of the Bureau of Reclamation in Boise.

With such a large area of raw land, it will be necessary to use every possible means to have the lands colonized rapidly and put into a state of production. With so much of the land in private ownership, it will be difficult to select all settlers, but we recommend that this be done as far as practical. We heartily recommend the employment of a competent agriculturist to aid and assist the settlers.

We recommend that provisions be made for clearing, fencing, and seeding to alfalfa a portion of each farm unit by the Bureau of Reclamation *wherever requested by the landowner*. This appears to us as a very important matter as it will make it much easier for the prospective settler to get started on a paying basis, and the work will provide employment for other settlers who may have some spare time or be in need of cash.

A good settler with a capital of \$4,000 should be able to bring a 40-acre unit into early production successfully provided he could obtain a loan from the Federal land bank as soon as a good portion of this land is under cultivation. The average settler will probably not

(Continued on p. 68)

## THE DEVELOPMENT OF OUR UNUSED AND IDLE LAND

*Wisdom demands that the Nation look about for the needed additional lands to supply food for our increasing population. To supply this demand the millions of acres of desert and swamp land will yield abundantly when reclaimed*

THE following extracts from a recent report on a proposed development point out clearly the need for a comprehensive plan of reclamation of arid, cut-over, and swamp land to provide food for the normal increase in population.

In making a study of the advisability of putting so many acres of new land under cultivation, there must be kept in mind the fact that the last part of the great West has passed into history, and that future tillable soil must come from irrigating our arid lands, draining our swamps, or clearing our logged-off areas. The world's population is constantly increasing, while the limit of the tillable area has been nearly reached.

In the rural districts of the United States the yearly increase of population is about 600,000. These young people know farming, and farming ought to be made profitable enough to induce them to remain on the farm. It will require approximately 100,000 new farms each year to satisfy such a need. The demand for agricultural lands is to be so great, and available lands that offer a reasonable chance for agricultural success so scarce, that rapid settlement of the more attractive areas may be definitely predicted.

If the entire twenty to thirty millions of remaining irrigable acres in the United States were reclaimed, the normal increase in farm population, requiring annually 100,000 farms, would settle such an area in half a dozen years, if the settlement

were thus concentrated. President Coolidge, in his letter to the Farmers' Conference, November 17, 1924, points out that we are already importers of foodstuffs which we ourselves should raise. Much is heard concerning the surplus of foods being responsible for the low prices received by the producer. The trouble is not that we as a nation are raising too much, but that producers of foodstuffs have no satisfactory selling organization. Existing conditions compel farmers to accept prices offered, while the speculator secures the handsome difference between what the producer gets and what a consumer pays.

The remedy is not to be found in importation of foodstuffs that are produced by cheap labor in foreign countries, but in a selling organization that will secure a reasonable price for the producer and guarantee a fair price to the consumer. The welfare of the country demands more and better food, especially for growing children. It matters little how much food is available if the price is such that the masses can not enjoy it. The amount consumed will be small.

As much farming land is being abandoned and going back to jungle and forest annually as is reclaimed by irrigation and drainage. The poorer lands are constantly being exchanged for more fertile ones. Business men frequently quit a poor location and move to a better one. Why should not the farmer leave his worn-out nonproductive lands and move

to those that are fertile? Many talk about abandoned farms. They ought to be abandoned. Many of them ought never to have been deforested. Baker wisely says: "The trend of the land utilization in the United States is toward the more intensive utilization of more fertile or more favorably located lands and toward less intensive utilization of less fertile or less favorably situated lands." Practically all the land that is easily available for agricultural purposes is now under the plow. Only by draining and reclaiming the wet lands, by clearing cut-over lands, and by irrigating desert lands can the producing area be increased.

The late Henry E. Wallace, Secretary of Agriculture, basing his estimate upon statistical information, stated that the population of the United States in 1950 would be 150,000,000. Dr. Raymond Pearl, specialist in vital statistics at Johns Hopkins University, in an article on "World overcrowding," estimates a population of about 150,000,000 in continental United States in 1950. Over the 1920 census, this is an increase of nearly 45,000,000. The Census Bureau estimates a population of 120,000,000 in 1930, about 15,000,000 over the population of 1920. To provide food for the normal increase in our population, not counting immigration, the Secretary of Agriculture estimated that it would be necessary to bring under cultivation 8,000,000 of acres per year, or approximately 240,000,000 of acres between now and 1950 (Yearbook of 1921).

"Improved land increased less than 5 per cent from 1910 to 1920, as compared with 15 per cent to 50 per cent of previous decades, and this 5 per cent increase was practically confined to the precariously productive semiarid lands of the Great Plains region. The land in the United States suitable for agricultural uses without irrigation, drainage, or heavy fertilization, is nearly all occupied. Consequently, one of the great questions before the American people is how to maintain the supply of foods and fibers for the increasing population at the high level to which we are accustomed." (O. E. Baker, Agricultural Yearbook for 1920, p. 409.) Wisdom demands, therefore, that the Nation look about for the needed additional lands to supply food for this increasing population. To supply this demand, there are about 110,000,000 acres of desert and swamp lands. The soil is rich and will yield abundantly when reclaimed.

## ECONOMIC PHASES OF VALE PROJECT

(Continued from p. 67)

have a capital of over \$2,500, and for him to succeed it will require that this land be partially in crop when he starts so that his farm will furnish him a living while he is bringing the rest into production.

If the settler starts off with his land partially in alfalfa and the Federal land bank will make a loan on the farm as soon as a good portion is in cultivation, it does not appear necessary for the Bureau of Reclamation to extend additional long-time credit. A great deal depends upon the attitude of the Federal land bank toward loans on a new project. If they will not make these loans or loans of sufficient size to help the settler over his development period, some other agency for extending credit will be required.

We believe the project is entirely feasible and will be able to pay out successfully under the proposed law providing for classification of land and for repayment of construction costs at the rate of 5 per cent of the gross annual returns. The relief afforded to the Warm Springs Irrigation District will go a long way toward solving their financial difficulties.

The banks and business men of Vale and vicinity will do all in their power to cooperate with the Bureau of Reclamation in the development of the Vale project and toward the successful colonization of it.

Respectfully submitted.

DALTON BIGGS,

R. H. DE ARMAND,

RALPH A. HOLT,

Local Committee on Vale Project.



## AN IRRIGATION SYSTEM THAT ELIMINATES WASTE WATER

*Newton Hibbs, of Twin Falls, Idaho, presents the following interesting statement regarding the application of irrigation water to crops by a system that eliminates waste water*

**I**T is most important to allot and deliver to the land the minimum quantity required to procure the highest return for the water regardless of maximum possible production of the land. Necessity will then force extreme conservation on the part of the farmer.

Several years of experience in power pumping at a high cost made me a water conservationist. I learned to apply the irrigation water evenly to every unit of the field and to waste none of the costly crop requisite.

The fact that waste water causes great loss of fertility from the soil through which the water drains, waterlogs the catch-basin areas, and causes great expense of drainage makes the elimination of waste water a matter of great economic importance.

Nobody will dispute the logical fact that the determination of the crop demand is practicable under all conditions of soil structure, topography, and climate. Also that infinite care and labor would make even distribution of the allotted water possible. And if no more water is supplied than the crop demands and consumes, there will be no waste water. Economy of distribution then becomes the only problem to be solved to eliminate an estimated 10 per cent waste of the present irrigation methods.

As a matter of fact, I have demonstrated economy of distribution while permitting no waste in fields under many varying conditions of topography. On steep fields I run supply ditches without grade, like terraces, on the slopes distanced apart to be most convenient for corrugation water runs. These terrace ditches are permanent with flat side slopes. The corrugations row-distances apart extend between terrace ditches.

The water is dropped from one level to the other through the corrugations between the irrigated rows. The terrace ditches distribute the water to the corrugations over tufts of sod used as head-gates for diversion. Blue-grass sod is the best diversion gate for equal distribution of small row-flows of irrigation water. Tufts of sod used for water diversion grow and become permanent. This sod distribution appliance is cheaper and better than any other diversion appliance known to me.

This terrace example is used here to illustrate my general system of water distribution. If the field is not steep I would prefer water row runs of about 250 feet between these terrace ditches. If the field is steep or has uneven planes the

water run must be determined by topography.

When the terrace supply ditches are once "set" the sodded diversions automatically control the waste water. The sod "sets" are permanent for one season and practically so from one season to the next. Water turned in the higher terrace and redistributed in succeeding terraces to the row corrugations is automatically regulated in quantity at every terrace ditch to meet the demands of every row corrugation below. One man can efficiently attend four 10-acre fields with appropriate water heads during the time required to irrigate such fields, unless the field grades are very irregular, and the row runs are necessarily very short.

To save time and water I provide a distribution trench at the border of the field to dam any water that might waste from neglect. From this foot terrace I make every corrugation a ditch in which the would-be waste water may back up in all trenches which are not supplied with water of equal amount from above. The higher sections of the field, while requiring regulation, may be evenly irrigated before the water is shifted to the next lower section. Any excess of water in different corrugations will be taken up by the next lower terrace for redistribution, but the flow is readily made practically even in all corrugations by timely regulation at the point of the row diversion.

When the distribution of water is effectively under control the cost of irrigation of fields of uneven grade is not greatly excessive. It is more expensive to install an automatic system of distribution for rough fields than for smooth fields, but the cost of irrigation is not great in any common case.

To make this effort more comprehensive I might describe my system of distribution as a system of terraces whether the field is level or steep. The water is run through corrugations in short runs and redistributed to a lower corrugated section of the field. From one terrace the water is dropped to the other in small streams, so small that even the cultivated soil will not be "washed." This flow should be regulated according to grade. When the rows have all been evenly irrigated in one section of the field the water will be dropped to the next lower terrace ditch, by a supply ditch, but not through the corrugations.

Such a distribution system may be cheaply constructed by ordinary plows and corrugators, and no technical labor is required. The grade of the corrugations is not important, and the water affords the best level for the terrace ditch construction.

The combined value of crop and livestock production in the United States last year was \$12,404,000,000, which was \$56,000,000 more than in 1923 when the total value was \$12,348,000,000.



Thinning sugar beets on the Strawberry Valley project, Utah

## PLAN FOR CURBING RECLAMATION LAND SPECULATION

*Kirk Bryan, geologist of the Geological Survey, describes a plan to check speculation in land, pyramiding of prices, and like evils in connection with the development of proposed new projects*

OBVIOUSLY the easier projects have already been built, and those now in contemplation involve large expenditures. One of the difficulties that any project faces is undue speculation in land, a phenomenon common to all projects and deprecated by all students of the subject.

In meditating on these matters it seemed to me probable that many of the projects now in contemplation and under investigation would never be feasible in our day unless a suitable device can be found for checking speculation and obtaining at least part of the construction charges from the increment in value of the land. The object of the United States in undertaking reclamation projects is, according to the reclamation act, "to create farm homes." The object of a settler is, however, more complex, for he wants not only a farm home, but he also wants to make money and to have security in his possessions. Accordingly he desires to own his land and to have the right to sell it at a profit. However, when a settler sells at a profit, the object of the United States is more or less jeopardized, for the farm home is then occupied by a new settler burdened by a larger capitalization, who is thereby less able, either to pay the Government lien or to participate to the fullest extent in the progressive life of the community. With every such sale the burden of overcapitalization increases until the farm is in the hands of a man who operates on too slender a

margin of credit. If in this process of selling for a profit the real value of the farm is overestimated the buyer is doomed to bankruptcy. It is, therefore, to the interest of the United States, and likewise to that of the community, to curb speculation and to prevent as far as possible too rapid transfer of land. The United States thereby will insure its lien and obtain [permanent and experienced farmers in its farm homes; the community gains in prosperity by the experience and tenure of its farmers and their freedom from too great a burden of debt. However, the measures taken to curb speculation should not prevent necessary transfer nor wholly prevent the settler from making a fair profit on the increase in the value of his land.

The proposed plan is not a complete plan for repayment of construction charges, but will be useful as a supplementary aid to any scheme of payment that may be adopted. It is simple and requires little machinery for its operation, and consequently will not increase materially the overhead cost of reclamation. It can be adapted to any proposed system of organization of the proposed project, but in the following paragraphs it is assumed that the current method of Federal reclamation to assess construction and operation charges pro rata on each acre involved will be used. In the last section of this paper, the application of the plan to the so-called district system of organization is outlined.

Under the proposed plan a contract will be made with each landowner under the project or with each entryman on the public land included in the project, providing that in the event of transfer of the title, except by inheritance or court order, a part of the construction charges will be paid to the Government. Transfer by gift, or purchase, or by a purchase contract shall be considered as transfers. The sum to be paid will be specified as a percentage of the construction charge in dollars per acre, and the Government will agree that the project superintendent or other official will give a certificate in writing, without additional cost, that the required money has been paid. In order to allow transfer in the period of construction before the total construction charges are finally known, the estimated charges will, for the purposes of this contract, be assumed to be correct. Payments made on these transfers will be credited to the land and will reduce the Government lien by their actual, not their percentage, amount. When the Government lien has been extinguished these assessments on transfer will automatically cease.

In those reclamation projects in which each landholder signs a contract for water-right, the contract outlined in the preceding paragraph will be merely a part of the main contract, which will provide for regular annual repayments according to the present practice.



Bee keeping is a profitable undertaking on many projects. Here is part of an apiary on the Shoshone project, Wyoming

### OPERATION OF THE PLAN

The plan is so simple that no administrative force will be necessary to operate it. Once the contract is signed, a clear title to the land can not be given until the terms of the contract have been fulfilled and the assessment, or, in other words, percentage of the construction charges has been paid. The money can be received and certificates of payment issued by officials already in existence on any project. The enforcement of payment, however, is provided for by local machinery by which similar restrictions that "run with the land" are enforced.

The effect on land speculation should begin before the project is undertaken, for landowners will realize that transfer before the contract is signed will save part of their profits. They will, therefore, as soon as the project seems certain, be anxious to sell and to sell to bona fide and qualified settlers so that the land may not come back to them for resale.

Similarly, after the project is started, owners will be induced to retain their land rather than lose part of the profit in selling. On the other hand, unless the percentage demanded as an assessment for the right of transfer is excessive, transfers for valid reasons can take place with ease and without bunglesome machinery.

That attempts will be made to evade payment is a foregone conclusion. It will be possible for a transfer to take place and for a quit-claim deed to be given and even recorded without a payment being made if buyer and purchaser are in collusion to evade the payment. But a clear title will not have been given, and the new owner will find that making a second transfer or

obtaining a mortgage is impossible, and he will be liable at any time to a suit for a breach of contract.

### THE PROPER PERCENTAGE

The success and effectiveness of the plan depends primarily on the percentage of the construction charges to be demanded with each transfer. Much thought, experience, and local knowledge will be necessary in the choice for any particular project. The writer has no fixed opinion, but suggests that 5 per cent on high-cost projects and 10 per cent on low-cost projects are percentages probably within reason, and can be used here for the purpose of analyzing the effect of the plan.

To take a concrete instance: On the Orland project most of the land was worn-out wheat land and worth a maximum of \$25 per acre as grazing land before irrigation. It sold as bare land for \$100 to \$125 per acre to the new settler. If 10 per cent of the construction charges of \$50 per acre had been assessed on this first transfer, whether it was paid by buyer or seller, there is no doubt that the transfers would have been made. Both parties would have been as well satisfied, and the Government would be that much ahead. It cost from \$20 to \$50 per acre to prepare land for irrigation and to get it into alfalfa. Such land was selling in 1914 for \$200 to \$250 per acre. If \$5 an acre had been assessed on such transfers, it is unquestionable that most of them would have taken place. However, as \$250 is near the value of alfalfa land at any time, later transfers would have been impeded. This is the time in the development of a project when it would be most advantageous to check speculation. As the value of

land approaches its ultimate or average value, the plan works as an increasing impediment to transfers, yet this is the very time when wild speculation boosts land above a true value and loads the farmer with the burden of overcapitalization. It is, therefore, one of the merits of the plan that it becomes most effective in checking transfers at this time.

However, if the spirit of speculation over-rides this hindrance, then we have the comfort that with each transfer the Government lien on the land is being reduced. During the excitement over Egyptian cotton on the Salt River project all sense of normal values was lost. Land was transferred with feverish activity. It sold for more than twice its value for raising ordinary crops. Many farmers sold dairy herds that they had been years in building up to buy additional land for planting to cotton. When the boom collapsed many formerly well-to-do and even wealthy farmers were almost bankrupt. It is doubtful if the plan, had it been in operation, would have prevented this speculation, but it would be a gain to the Government and would be to the ultimate interest of the owner to have the land, heavily mortgaged and operated by men almost bankrupt, free of a part at least of the Government lien.

### ADVANTAGES OF THE PLAN

Under the plan, failure to pay an assessment at the most clouds the title, and the cloud can be removed by the payment of 5 or 10 per cent of the construction charges. This is a known sum. Whether or not it has been paid can be determined

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Plowing sugar beets on the Huntley project, Montana

## CURBING LAND SPECULATION

(Continued from p. 71)

at any moment either by consulting the project superintendent or the county records. Thus all parties are protected and no orders, proclamations, or lawsuits are necessary to enforce the penalties placed on speculation, for if the amount has not been paid at transfer the Government need only wait until a second transfer or until the owner wishes to mortgage his property.

These practical advantages are far outweighed by the psychological advantages that this plan has over any plan that attempts to prohibit profit in the sale of real estate. Our Puritan forefathers anticipated the profit from the increase in the value of land, and such profits have so long been enjoyed that the right to them is an integral part of our social structure. It therefore runs counter to every instinct of a man accustomed to business under our institutions to deprive him of the right to take the profit in the increased value of land. The new plan does not prohibit the sale of land for a profit, but merely penalizes transfers. The penalty is not so great as to prohibit them until the sale price rises to a point where it yields a small profit only. At times when farm products are down and the faint-hearted wish to sell, the buyers will compel the sellers to pay the assessment. At times of inflation the buyers will have to pay the assessment. The amount of the assessment, however, is small and will usually be no larger than the fee of the real-estate agent. It can not be contended, therefore, that it will prevent buying and selling. Yet with each transfer the land is nearer the ultimate goal of being free of the Government lien.

### BUILD UP THE FARM

A farm unit is not a farm, but it holds the possibility of being made into a farm. This fact has often been overlooked by settlers. They have frequently used alfalfa as a cash crop instead of utilizing it to the fullest extent as a farm builder. They have been satisfied with the benefit derived from a rotation including alfalfa, when much greater benefit might have been secured by returning to the soil 80 per cent of the fertilizer value and most of the humus-producing material of the foliage of the plant through the avenue of livestock. Roots and stubble are good for the soil, but roots and four-fifths of the foliage are much better.

### THE PLAN UNDER A DISTRICT ORGANIZATION

There is no inherent reason why the principle of the plan of assessment for transfers of land can not be made applicable to projects having this form of organization. Cooperation of State authorities is required, but this help is also a necessary preliminary to any use of the district plan of organization for Federal projects. It will doubtless be necessary for the State legislature to amend the State law under which such districts are organized.

The form in which this provision will be worded will doubtless vary somewhat because of the differences in detail between the laws of various States. In general, however, the amendment should state that all real estate within the boundaries of the district is subject to a special assessment on transfer except transfers by inheritance or legal process; that the assessment shall be a percentage (to be stated) of the assessed value of the land; that moneys derived from this assessment shall be paid into the sinking fund set up to retire the bonds of the district; that this assessment shall be made for every transfer for so long a time as the district has a bonded indebtedness and no longer; that the moneys shall be collected by the county treasurer, or other officer, who will give a certificate of payment subject to record by the county clerk or recorder; that failure to pay the assessment shall be subject to all the penalties applicable to nonpayment of any State or county tax.

The provisions given in the foregoing paragraph are complicated in statement largely because the plan under the district organization is part of a legal system instead of being simply part of a contract between a landowner and the Government. In operation, however, it requires no machinery not already provided by the local governments. No special responsibility will rest on the Federal Government.

The incidence of the assessment is the same, but the application of the money is not so direct as in the other plan of organization, in which the assessment is an

### MILK RIVER PROJECT COOPERATIVE BOARD

The members of the local cooperative board on the Milk River project, Montana, are as follows:

*Chinook division.*—A. G. Middleton, Chinook.

*Malta division.*—T. J. Larson, Malta.

*Glasgow division.*—J. L. Truscott, Glasgow.

advance payment on construction charges which are a prior lien on the acreage involved. The parties to the transfer by paying the assessment are relieving themselves of a future liability. The lands that are transferred most frequently are those which will be free of the Government lien in the shortest time. Under the district plan such direct incidence is impossible. The assessment will go to reduce the liabilities of the whole district. On the other hand, the assessment is to be made on the value of the land as assessed for general taxation. As this value is the most sensitive indicator that we have of benefits received or losses sustained, it follows that the assessment will be lightest on those lands that may, because of their poor quality, have frequent transfers and will therefore be penalized the more frequently. On the other hand those lands whose value increases rapidly and which are likely to have numerous transfers because of speculation, will have the heaviest assessment. The increasing assessment for transfers as values rise will tend to impede speculation, the desired object, and at the same time these lands are best able to pay an increased share of the cost of reclamation.

It seems, therefore, that the proposed plan is applicable to either the original organization of Federal irrigation projects or to the district organization.

Crop production in 1924 had a farm value of \$11,404,000,000 compared with \$10,401,000,000 in 1923, but of this value some \$4,951,000,000 worth of crops were fed to livestock, whereas in 1923 the value of crops fed to livestock was \$4,286,000,000.

### DON'T MINE THE FARM

Farming is not mining. A miner is not expected to put anything back. A real farmer puts back whatever is required for soil improvement. He does whatever is needed to strengthen the weakest link. Even if the nitrogen content should remain stationary as a result of fixation by bacteria on the roots of alfalfa, selling the foliage off the farm in the form of hay removes other plant foods. That which should be returned goes to enrich the farms of others. Feeding crops on the farm retards depletion. Whether manures are a food or a health restorer, they are necessary, and they turn the trick when they become incorporated with the soil.



## ARE DAIRY COWS PAYING?

**H. A. IRELAND**, associate agriculturist on the Uncompahgre project, Colorado, states that to answer for his own information the above question, R. C. Nash, of Spring Creek Mesa, recently had a 48-hour test made on his herd. The days for the test were set a week in advance, and the test was made at the time set, although two of the cows of the herd were out of condition; so the results ought to be no better than an average. For the two days all the feed of the herd was carefully weighed and the cost computed on the basis of present market prices. Each cow's milk was weighed and tested at each milking. The skim milk and the cream were weighed and tested at each separation, and the cream from the two days was marketed separately. No other milk except that from the cows on test was run through the separator, and no cream from these cows was taken out for household use during the two days. In every respect the test was made as fairly as it was possible to do it. The results were interesting.

The first thing found was that in spite of the utmost care in weighing there was a loss in the handling of 13.3 pounds of milk from a total of 595 pounds produced; that is, the combined weights of the cream and the skim milk lacked that amount of equaling the weight of the whole milk, even though no milk was spilled. The second interesting thing discovered was that the separator was running at least seven times as much fat over into the skim milk as a good separator should do, the fat test of the skim milk being above 0.20 of 1 per cent, whereas 0.03 is the limit of good skimming.

The eight cows used in the test are all grade Holsteins. They average 3 years 6 months of age and have milked an average of 114 days since last freshening. Their average daily production was 37.2 pounds of milk and 1.2 pounds of fat. Their daily feed consisted of 33.6 pounds of alfalfa hay, one-third of which was third cutting and two-thirds first cutting; 12.5 pounds of uncooked cull potatoes, and 5 pounds of ground oats. Hay was valued at \$9 per ton, potatoes at 25 cents per hundredweight, and ground oats at \$2.10 per hundredweight, making the cost of the feed for the two-day period \$4.60. The amount of hay was all that the cows could be made to eat.

The cream was sold at a local cream station at the current price of 40 cents

per pound of butterfat. The private test of the cream checked exactly with the test made by the creamery.



Good dairy cattle mean healthy youngsters

The following table shows in condensed form the results of the test:

Number of cows, 8.
Average age, 2 years 6 months.
Average days in milk, 114.
Average two-day production, 74.4 pounds milk, 2.4 pounds fat.
Weight of whole milk, 595.2 pounds.
Weight of skim milk, 526.3 pounds.
Weight of cream, 55.6 pounds.
Loss in weight, 13.3 pounds.
Computed butterfat, 19.4 pounds.
Butterfat sold, 16.7 pounds.
Butterfat in skim milk, 1 pound.
Butterfat not accounted for, 1.7 pounds.
Estimated value of butterfat, \$7.77.
Amount actually received, \$6.68.
Cost of feed for two days, \$4.60.
Profit above feed cost, \$2.08; <sup>1</sup> \$2.40.
Profit per cow per day, \$0.13; <sup>1</sup> \$0.15.
Stated in another way, the cows, with butterfat at 40 cents a pound, are paying 25 cents a hundredweight for cull potatoes, \$2.10 a hundredweight for ground oats, and \$16.70 a ton for hay which would be increased to \$17.90 a ton with the cream separator working properly.

<sup>1</sup> Profit if loss in skim milk stopped.

When butterfat was selling for 35 cents a pound there was a general feeling that there was no profit in milking. Mr. Nash found that 26 cent butterfat would just about pay the above prices for his feed. He figures the skim milk, calves, and manure against his labor and other expenses, except the feed.

It should be understood that these figures apply only to cows of this particular test. There are other cows not far from here that would not make a profit on anything. On the other hand, there are cows that might show up better than these, and it may be that Mr. Nash's herd would make a better showing with different feed.

Five of the cows in this herd are heifers sired by a bull sold recently for \$16. Mr. Nash bought him as a calf for \$200 and thinks he got a bargain.

In 1916, Thomas F. Grim, a Montana homestead entryman, with his wife Rosie Grim, executed a mortgage upon the homestead before patent had been issued. Afterwards Thomas F. Grim abandoned the entry and relinquished it to the United States, the Grims were divorced, and in 1920 Mrs. Grim made homestead entry for the same land and in due time received patent therefor. In a suit to foreclose the mortgage, the wife contested the validity of the mortgage. The Supreme Court of Montana held the mortgage to be good under the circumstances. (*Lohman State Bank v. Grim* (Mont.), 222 Pac. 1052.)



## SAND SLUICING ON THE RIO GRANDE PROJECT

*Measures to cope with the conditions have consisted of improvement of diversion facilities, increased velocities in the main canals, and the establishment of long crest weir structures at turnouts from the main canals, as described by Project Manager Lawson*

THE average amount of sediment carried by the Rio Grande, as determined by analyses over a large number of years, is 1.7 per cent—almost twice that of the Colorado River at Yuma. This fact largely influenced the design of Elephant Butte storage dam of the Rio Grande Federal irrigation project, and made necessary the creation of larger storage capacity, in order to take care of the effect of the deposition of the sediment in reducing the reservoir capacity. Practically all of this sediment is now deposited in the upper reaches of the reservoir, and the discharge from Elephant Butte Dam for irrigation purposes is free from silt and sand brought down from upper river sources.

This silt was in such finely divided particles that it was transported principally in suspension, and for this reason was difficult to separate from the canal water supply, either by surface skimming, under-sluicing or periodic sluicing through limited area settling basin methods. It deposited in the bottom and on the berms of the canals in strata, and once set, required team or machine methods to remove. Because of its tendency to remain in suspension a large percentage of it was formerly carried by the water out into the farm ditches and even spread over the entire area irrigated. With Elephant Butte Reservoir in operation, the silt now settles out in storage, and the canal and lateral maintenance problem on the Rio Grande project has changed from the annual removal of silt from canals and laterals to that of preventing the deposition of sand.

Unlike the finer silts, the movement of the sand is more a rolling along the bottom of the channel than being carried in suspension, and while the silt moves at the velocity of the water, the sand movement is much slower. The principal difference, however, which influences the methods of handling and makes it possible under favorable conditions to hydraulically control the amount of sand entering the canals, or to remove it after it has entered, is that while the sand "settles" more rapidly with a decreased velocity, it does not become bedded or "stay put" as the silt does. As long as there is sufficient velocity to move the sand at all, there is a constant drifting, or rather rolling of it down the channel, and even though it does become temporarily lodged, it is easily set in motion

again and can be "picked up" or cut out by a proper increase in velocity. Practically none of the sand is carried on the fields with the irrigation water, that getting into the smaller laterals or field ditches soon settling in them.

These characteristics of sand movement on the Rio Grande project have led to two general schemes for the hydraulic control of sand in the irrigation canals; first, to prevent as much of the sand as possible entering the canal by settling basin and skimming weir arrangements at the diversions, and, second, the removal of it from the canals by sluicing through wasteways. The success attained by each is proportional to the amount of water available for waste and sluicing purposes and to the differences in head. Cleaning sand from canals by team and machine methods is not only expensive, but often difficult, and sometimes involves right-of-way trouble. One of the peculiarities of the sand problem is the rapidity with which certain sections of the canals sand up (usually near the head), thus crippling the capacity of the entire system. By a proper manipulation of check gates and the canal flow, an accumulation of sand may be cut out of one stretch of canal, only to settle in another section, but by a repetition of this performance it can eventually be carried to a wasteway if a suitable one is available.

### SLUICING AND SKIMMING ARRANGEMENTS AT DIVERSIONS

The diversion on the Rio Grande project now provided with special settling, skimming, and sluicing arrangements is the Franklin Canal heading, and this has been a development to meet changing contingencies. This diversion makes use of the old Mexican Diversion Dam, and when the canal was first reconstructed rather than to follow out the customary arrangement of placing sluice gates in the old diversion structure directly in front of the headgates, an enlarged canal section for a distance of 600 feet below the headgate was made for a settling basin, at the lower end of which the sluice gates were placed. As the sand conditions developed and the river bed itself built up below the diversion, almost eliminating the difference in head required for successful sluicing, the sluicing facilities became inadequate and the canal sanded to such an extent that it was only possible to secure a diversion of around 100 second-feet in a canal designed

for 400 second-feet. With these conditions to contend with, it became necessary to raise the sides of the settling basin and to provide greater capacity to the head and sluice gates, so that sufficient water could be passed through the basin during sluicing periods to move some of the accumulated sand deposit, the movement being accomplished as much by the volume of water as by the remaining slight difference in head through the sluice gates. In addition, arrangements were made to take off the irrigation supply by skimming the surface water from the basin over a long weir along one side.

With these improvements installed, and by sluicing one hour each day, it is now possible to supply as high as 350 second-feet through the canal. The frequent sluicings are necessary because it is only possible to move about 1.5 feet of sand from the settling basin at a sluicing, on account of the limited difference in head available.

Following are the principal points to be observed in an improvement of the layout. The sluicing gates and skimming weir are located on opposite sides of the settling basin, near its lower end. This arrangement will not move the sand from directly in front of the weir during sluicing. The sluice gates should be adjacent to and at approximately right angles with the weir at the lower end of the settling basin. The adjustable portion of the weir consists of a steel shutter, sliding past the front of a low concrete trapezoidal weir on the settling basin side. Sand settles against these gates, and because of the lack of sufficient head to remove it all by sluicing they can not be lowered into the sand to adjust the weir crest.

Percha Diversion Dam is the first diversion below Elephant Butte Reservoir, and the river has not accumulated an appreciable load of sand at this point. However, daily sluicing is practiced, and sand is thereby practically eliminated from the Rincon Canal system. This dam is the highest of the diversion dams of the project, and the sluice gates are set to the lower level, making this the only diversion where effective sluicing without special arrangement can be practiced. The height of the dam and the elevation of the headgates above the sluice gate sills and floor provide an ample settling and sand storage sluicing basin without special design for one.

At Leasburg Dam the canal headgates are set in a rock cut section of the canal, about 60 feet from the east abutment of the dam, and the sluice gates are located in the entrance channel at right angles to and adjacent to the headgates. An ideal wasteway is located approximately one mile below the heading at the dam, and it is by this that most of the sluicing is accomplished. The waste gates are set four feet below the theoretical grade of the canal, making in effect a settling basin of the first mile of canal.

Mesilla Dam is the radial gate type of crest. No special skimming or sluicing arrangements are provided, except that the two gates next to the headgates on each end have lower sills for sluicing purposes. There is not a great difference in head through the dam, and the diversion of a great per cent of the water through restricted undershot headgates makes the sand problem at this point a particularly annoying one.

The sand problem, however, reaches its most serious proportion in the several diversions without dams or sluicing facilities below El Paso. Here, as the lower end of the project is reached, the situation resolves itself to that of diverting the water with a minimum of waste, and the available sluicing water becomes less and less in proportion to the diversion use. Furthermore, the generally high river bed through the valley precludes the possibility for effective sluicing through wasteways. Flatter canal slopes add to difficulty in keeping sand moving through them.

#### REMOVAL OF SAND FROM CANALS BY SLUICING THROUGH WASTEWAYS

Where the country slope and topography will permit, the grades of the canals

and main laterals have adjusted themselves to the natural sand slope, or slope on which the sand continues to move with the water flow. This has partially or entirely eliminated many of the grade drops in the original structures, and in many instances has necessitated bank raising below these structures. Under these conditions the object to be attained is to hold as much of the sand as possible in the main canal, or in such main laterals as have effective wasteways through which the sand can be sluiced.

Special structure types developed to accomplish this end are wide headings with skimming weirs for dead end laterals, or laterals which return their waste into other laterals, and wasteway structures with gates set 3 or 4 feet below the canal grades when there is sufficient head to permit a clear drop. The lateral headings from main canals are long weirs taking off the top water with the least possible disturbance of the canal flow. The usual construction has been a concrete wall part way, with railroad rail flash board guide posts supporting a walk plank or brackets. The crest is of sufficient length and adjustable, with flash boards to take only the top 0.4 to 0.6 foot of water. Since installing such special structures and readjusting the canal grades, success in moving the sand through the main canals has been very gratifying; in fact, removal of the sand by team or machine methods has been very limited and confined to the flatter grade section of the main canals and to smaller laterals not provided with special headings or on flat grades without effective wasteways. If the sand condition continues on indefinitely, however, in as extreme a degree as at present, the wasteways will reach the limit of their usefulness.

The measures so far adopted in keeping main canals reasonably free of sand accumulations by providing improvements in diversions have been reasonably successful in reducing the annual maintenance charge and preventing water shortages by decrease in canal channel capacity. This has been accomplished, however, at the expense of returning to the channel of the Rio Grande, which is the main canal of the project, large quantities of sluiced materials, which, added to that deposited by the river itself, is gradually filling this main canal in the lower portion of the project with accumulations to an elevation in many cases higher than the surrounding farming country.

The complete solution lies in a rectified river channel, with elimination of the meanders and the construction of protected embankments, which will confine the limited flow with a greater slope with such additional provisions in inflows from side arroyos and spillway discharge from Elephant Butte Dam and such surplus water as will duplicate the former scouring action of the large floods in the restricted and regulated channel provided.

The amount of water to apply in one irrigation, the length of the interval between irrigations, and the total quantity used in any one season all depend on a large number of soil, crop, and climatic conditions.

The surface between field laterals should be so evenly graded that water will flow in a thin sheet over the entire surface, the excess being caught up by the lower lateral.

Too much as well as too little moisture in soils injures plant growth.



Annual meeting of the Tieton Water Users' Association, Yakima project, Washington, 450 of the 1,300 members present

## BLACKHEAD CONTROL IN TURKEYS ON NEWLANDS PROJECT

L. E. Cline, agriculturist, describes methods used to prevent disease, based on liberal use of pulverized tobacco with an occasional dose of Epsom salts



Left: Outdoor roosting facilities handling large number of turkeys. Right: Fifteen hundred turkeys grown successfully on blackhead infested ground, with the use of pulverized tobacco, by C. L. Crew, Fallon, Nev.

**S**UCCESS or failure in the production of turkeys on a commercial scale has been dependent largely upon the success of the grower in avoiding the ravages of blackhead disease. Since no proved remedies were available for combating blackhead disease, the fortunes of the turkey grower lay in keeping out of the way of it as long as possible and quitting the business when the disease finally overtook him.

Many a turkey-growing district in the older settled parts of the East has been forced to abandon this profitable industry when this dreaded disease once put in its appearance.

Unfortunately for the turkey grower little progress toward a practical solution of this problem of control was made in the study of the blackhead disease in turkeys until very recently. Many remedies had been proposed for the control of blackhead, but the results from their use were very generally disappointing. Most all treatments were based on the principle of intestinal disinfection and strict sanitation. Whatever good may have come from these methods of treatment can no doubt be attributed to the sanitary measures carried out. Recent investigations show that antiseptics, dilute enough for the turkey to tolerate, can have little damaging effects on the blackhead organism.

**New information on disease.**—Fortunately for the present-day turkey grower new information has made it possible to make real progress toward combating the blackhead disease. Perhaps the most important step in this progress was made

when some new phases of the life history of the organism causing the blackhead disease were discovered. Recent investigations by Smith and Graybill, of the Rockefeller Institute, and Kyzzer, of Harvard University, indicate that the blackhead organism ordinarily does not produce blackhead disease except in association with the common cecum worm (*Heterakis papillosa*). It would seem, therefore, if our fowls are kept free from this intestinal worm, that there will be little likelihood of blackhead disease.

**Tobacco used to combat blackhead.**—Acting upon the above suggestions, the writer has made numerous observations during the past year on the effect of combating blackhead disease in turkeys by administering pulverized tobacco as a vermifuge, following the method of treatment for intestinal worms in poultry devised by the California Agricultural Experiment Station, with the idea that without intestinal worms there would be no blackhead. The results of these observations have greatly strengthened the belief in this method of treatment. Turkey growers on the Newlands project in Nevada, who have heretofore met with discouraging losses, claim that with this treatment they have no fear of blackhead.

The first method of tobacco treatment employed here is similar to one of the California methods and consisted in making a tobacco decoction of 1 pound of cheap tobacco and mixing this with just enough wheat bran for 100 birds regardless of size. This was fed after fasting 24 hours. This feeding of tobacco was followed in three or four hours with

Epsom salts, at the rate of 1 pound dissolved in sufficient water to moisten a small amount of bran mash for the same number of birds. This method of treatment proved very beneficial and was repeated as often as seemed advisable. This first method, however, was soon replaced by the more commonly used California method, namely, the feeding of pulverized tobacco, 1 part tobacco to 25 to 50 parts of wheat bran or mill run. This mixture was kept in front of the turkeys all of the time, and according to local experiences they consumed sufficient of the tobacco to keep themselves free from intestinal worms and consequently free from blackhead disease.

**Amounts of tobacco used.**—The amount of tobacco used by local growers in combating blackhead disease has varied considerably. Fowls seem able to tolerate very large amounts of tobacco. One grower reports good results from administering a good-sized dose of pulverized tobacco and mill run half and half to turkeys in advanced stages of blackhead disease. Another grower reports good results with two 10-day feeding periods with free access to pulverized tobacco, 2 pounds to 100 pounds of mill run, with each 10-day period followed by a dose of 1 pound of Epsom salts for each 100 birds. Other growers feel that it is advisable to keep pulverized tobacco in front of the turkeys continuously at the rate of 2 per cent of their ground feed. The essential items are to feed sufficient tobacco to act efficiently as a vermifuge and to give Epsom salts occasionally to

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## CROP CONDITIONS ON THE PROJECTS

**T**HE following is a brief statement of crop conditions on the irrigation projects of the Bureau of Reclamation, Department of the Interior, at the close of March, 1925:

*Yuma project, Arizona.*—It is expected that the cotton acreage will be somewhat larger than that of last year. The alfalfa acreage will be about the same. The first cutting of alfalfa was being baled and shipped. Considerable attention was being paid by farmers to improved methods of farming. Bearing trees on the mesa have set a heavy crop.

*Orland project, California.*—The first crop of alfalfa was ready for cutting early in April. Frosts damaged the apricots to some extent. Spring planting of orchards was about completed.

*Grand Valley project, Colorado.*—The demand for alfalfa hay fell off, and some farmers were having difficulty finding a market for all of last season's crop. A considerable acreage of early potatoes had been planted. Rain at the end of the month was beneficial to winter wheat and alfalfa and put the ground in good condition for plowing.

*Uncompahgre project, Colorado.*—The demand for hay remained good, and considerable surplus hay was disposed of at prices ranging from \$10 to \$12 a ton. An additional bonus of 50 cents a ton for the 1924 sugar-beet crop was announced by the sugar company, bringing the total to \$7.50 a ton. The onion market remained steady, and the potato market improved slightly.

*King Hill project, Idaho.*—The ground was in good shape for the season's agricultural operations, but little preliminary farm work had been done.

*Minidoka project, Idaho.*—Sugar-beet plantings were comparatively light. The area under contract will, however, exceed 8,000 acres. The high price of wheat tempted many farmers to abandon beet culture for the less exacting work of grain growing.

*Huntley project, Montana.*—Practically all winter wheat was killed by the cold weather, and the area was being replanted to spring wheat. Some seeding was done, and considerable land had been prepared for seeding.

*Milk River project, Montana.*—Grain prices declined during the month. No farm work had been commenced.

*Sun River project, Montana.*—The weather was favorable for early plowing, and farmers were beginning to get the ground in shape for planting. A consid-

erable quantity of alfalfa hay on the Fort Shaw division was baled and shipped. Interest was being taken in sugar-beet culture, and the sugar company, in conjunction with the Great Falls Commercial Club, had hired an experienced field man to assist farmers in taking care of the crop. If a sufficient acreage is signed up, a beet dump will be constructed, with prospects for the construction in 1927 of a sugar factory in the vicinity of Great Falls.

*Lower Yellowstone project, Montana-North Dakota.*—Soil conditions were favorable, and some seeding of wheat had begun. Considerable hay was left over from last season.

*North Platte project, Nebraska-Wyoming.*—The soil was in splendid shape, and farmers were busy putting in grain. No satisfactory settlement had been made between the sugar company and the Co-operative Beet Growers' Association on the 1925 contract terms, and the association had recommended that growers plant other crops.

*Newlands project, Nevada.*—Cut worms retarded alfalfa growth in several localities.

*Carlsbad project, New Mexico.*—Hay stored on the project sold locally at prices ranging from \$23 to \$25 a ton. Plowing had been completed by the mid-

dle of the month and cotton planting started.

*Rio Grande project, New Mexico-Texas.*—Cotton will be the principal crop, and 70,000 acres will be planted. A number of growers had contracted to sell the entire season's yield at a price between 24 and 25 cents a pound. Indications pointed to a good fruit crop.

*Williston project, North Dakota.*—The soil was in excellent condition, and spring plowing had begun. The railroad company decided not to build a spur to shorten the beet-hauling distance, thus lessening interest in this crop, and the sugar company had not made final decision as to dumping facilities.

*Umatilla project, Oregon.*—Owing to winter killing, the first crop of alfalfa from many fields was expected to be poor.

*Klamath project, Oregon-California.*—Considerably more hay was left on the project than had been anticipated, and some farmers who were holding for higher prices will be forced to carry the surplus over. Spring plowing was about completed and most of the grain crops had been seeded.

*Belle Fourche project, South Dakota.*—Preparation of the ground for planting was quite general, and some spring grains were seeded on the sandy soils. Gumbo soils will require more drying. A second bonus of \$1 a ton was paid to the beet growers on the 1924 crop, bringing the total to \$7.50 a ton.

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## BLACKHEAD CONTROL IN TURKEYS

(Continued from p. 76).

flush out the intestinal tract and assist in relieving the turkeys of intestinal worms and blackhead infection.

The beneficial results of this method of combating blackhead have been a surprise to local growers, and they feel that a big step has been taken in saving the turkey industry from annihilation by the ravages of blackhead.

*Strict sanitation essential.*—Strict sanitary precautions and the liberal use of pulverized tobacco with an occasional dose of Epsom salts will be relied upon by Newlands project turkey growers during the present season.

During the past seven years, practically all the suggested treatments for blackhead have been given a thorough trial by local turkey growers, but it was very evident that none of these remedies, except tobacco, gave any assurance of relief to the grower, other than such relief as might be gained by strict sanitary precautions.

Now, that more is known concerning the life history of the blackhead organism,

especially its relation to the presence of the common intestinal round worm, rapid progress should be made in successfully combating the disease. Experiences of Newlands project turkey growers have served to substantiate the findings of the investigators. In the light of what has been accomplished so far, there seems to be a possibility of utilizing nicotine preparations as well as tobacco itself for combating blackhead.

During the season of 1925 field demonstrations will be conducted on the Newlands project by the Office of Demonstrations on Reclamation Projects for the purpose of determining the feasibility of the use of nicotine preparations for combating blackheads in turkeys, and also to make further study of the amounts of pulverized tobacco to be used and the proper methods of feeding it.

Some very definite information along these lines should be secured during the present year.



## SPRINGTIME IS PIG TIME

**S**PRINGTIME is pig time on most farms. It is the season when more can be done than at any other time of the year to make pork production profitable, for a pig well started may be said to be well on the way to market. After he is a few weeks old and has successfully passed the weaning period he is pretty well able to take care of himself if he is given access to plenty of the right kinds of feed. Therefore particular care should be taken at this time in order to make the job easier later in the season and the profits greater. A pig that grows well from start to finish is always the desirable and most profitable one, no matter whether the price of hogs is high or low.

First of all, the pig in order to be profitable must be well bred and of good type. He must have in his veins the blood of animals that have had the capacity to turn a minimum quantity of feed into a maximum quantity of meat. But even a pig starting with these advantages may be a poor piece of property if he is badly handled or if fed improperly. He may get a bad start in

competition with his litter mates; he may be stunted at weaning time; worms may sap his vitality; the pasture provided may be insufficient for his needs; or, if precautions have not been taken, cholera may whisk him to an untimely and unprofitable end. But among these possibilities there is none that can not be guarded against.

The opinions of hog raisers vary widely as to the age at which pigs should be weaned. Some of them take the youngsters away from their mothers at 5 weeks, others at 12 weeks, and still others may make them shift for themselves at any age between these extremes. In exceptional cases breeders will leave pigs with the sows even when they are more than 3 months old. Unless there is some special reason for so doing, pigs should not be weaned until they are at least 10 weeks old, and a sow that will not suckle her litter for this period is undesirable as a mother and should be discarded from the herd.

Some farmers and breeders wean the pigs at an earlier age in order to get two litters a year, but it may be better practice to give the pigs a stronger start and raise only three litters in two years. It is better to raise fewer pigs and have them well grown than to raise a larger number and have many of them stunted.

When a litter is to be weaned, attention must be given to the sow's condition as well as to the pigs. To bring about a favorable condition for weaning, the quality and quantity of her feed should be reduced for four or five days before the pigs are to be taken away. This will result in a reduced flow of milk and tend to prevent udder troubles. The sow should be removed from the pigs rather than the pigs from the sow; the youngsters being left in the quarters to which they are accustomed and having access to a self-feeder which they should have learned to use several weeks earlier. In case a sow's udder after she has been taken away becomes so distended with milk that it is painful, she may be returned to her family for a short time for relief. It will seldom be necessary to return her more than once.

When the pigs are weaned do not change the ration. Leave them on good pasture, with access to the self-feeder containing corn and shorts or middlings. If during the suckling period, or after, skim milk or buttermilk is added to the ration, commence feeding it in small quantities, gradually increasing it from day to day. Sudden changes are always to be avoided.

If a sow farrows March 15 and the pigs suckle 10 weeks, they will be weaned May 24. If the sow is in good condition she may be immediately rebred; that is, within three or four days after the pigs are weaned. If she were rebred on May 28, she would farrow again about September 16, and the pigs would be weaned November 25, making possible rebreeding for

## CROP CONDITIONS

(Continued from p. 77)

*Strawberry Valley project, Utah.*—Soil conditions were excellent. Practically all spring wheat had been sown, and a good start made on drilling in peas and sugar beets. The condition of fall grain was excellent. Alfalfa fields were turning green, and the fruit trees were beginning to bud. Farmers in general reported the outlook the best in several years.

*Okanogan project, Washington.*—Prospects of a large apple crop were excellent, with prices still good and a forecast that they will remain so during the year.

*Yakima project, Washington.*—The alfalfa tonnage will be considerably reduced by winter-killing and many farmers were plowing up their fields for reseeded or planting to other crops.

*Shoshone project, Wyoming.*—Considerable headway had been made in plowing and preparing the fields for crops. The sugar-beet acreage will be considerably less than that of last year, but contracts had been made with a seed company to raise seed peas on 700 acres at prices ranging from  $3\frac{1}{4}$  to  $5\frac{1}{4}$  cents a pound, depending on the variety grown.



One of the many prize hogs on the Rio Grande project



March 20 farrow. It is not always possible, however, to keep to such a schedule, and the raising of two litters a year and having them all come at the proper time is impossible. If, however, the pigs are allowed to suckle 10 weeks, it should be easily possible for a sow to raise three litters in two years, and it is probable that more profit would be made this way than by crowding the sows too hard.

The treatment of the sows is just as important as that given the pigs. After they have been taken away from the litters in the spring, they may be put on pasture and given a small quantity of grain, the ration being determined by the quality of the pasture and the condition of the sows. Sows 2 years old or over, weaning spring litters and not being bred for fall farrow, may be successfully carried for two or three months on good alfalfa or clover pasture without grain. Very thin sows, and gilts weaning their first litters, should be separated from the other sows,

placed on good pasture, and given a liberal grain ration. Usually the thin sows will gain rapidly enough to be taken out within 30 days and placed with those maintained on pasture alone, but it is desirable to feed gilts some grain during the entire period between the weaning of the first and second litters. The management of the brood sow is the best test of the herdsman's skill.

During the early spring the hog raiser should be giving a great deal of thought to pasture for his herd. It offers one of the best possibilities for cutting costs. This does not mean that it is possible to fatten or even to make satisfactory growth on hogs by using pasture alone. For best results, it must be supplemented with grain. Another important fact to consider is that lasting properties of pasture can not be measured out exactly. There must always be a surplus so that it will not be necessary to graze closely. Hog pasture should signify abundance.

So much depends upon the crop used, the quality of the soil, and climatic conditions that it is impossible to say how many animals may be pastured on an acre, but ordinarily an acre will furnish pasture for from 5 to 15 hogs averaging 100 pounds. A good plan is to provide two pastures for a single bunch of hogs, alternating the use of them. In this way fairly close pasturing may be practiced and succulent feed provided. Pasture crops which are allowed to mature do not furnish good feed for hogs. When seed is about to form the field may be clipped to restore succulence.

In considering pastures, it should not be forgotten that the manure from the hogs, which is evenly spread, is of great value in building up the land.

The value of good pasture for breeding animals is hard to overestimate. It provides desirable feed, and in obtaining it the animals take the exercise which is so necessary to best development.

In most all hog-growing sections permanent pastures are generally used, but these permanent pasture grasses are not desirable except in inclosures where the hogs have comparatively wide range. Where small lots are used or a considerable number of hogs are kept, it is always advisable to plow up such lots or pastures once or, better, twice a year. Many successful hog men handle their permanent pastures by turning in only such numbers of hogs as will permit the grass to grow up and produce a hay crop. Among the best pasture plants are alfalfa, red clover, alsike clover, white clover, blue grass, bur clover, Bermuda grass, lespedeza, carpet grass, crab grass, and Dallas grass. The first five of these are used in the northern half of the United States and the others in the South. Blue grass and white clover

are generally grown together. Timothy is often grown with red clover. All of the grasses used in the North are also grown to some extent in the South. Of the permanent-pasture plants, alfalfa heads the list as forage for hogs. Where it can be grown no other permanent pasture is necessary.

Temporary pastures are made use of on a large number of hog farms as a supplement to permanent pastures, or to fill the gap where permanent pastures can not be grown. Every barnyard and small lot where hogs are kept should be plowed and seeded at least once a year, and as they are usually well fertilized they produce abundantly. The most common temporary pastures are rye, oats, rape, soy beans, and cowpeas. They are grown in practically all parts of the country.

## HOG PRODUCTION ON THE PROJECTS

In utilizing farm wastes and in converting the concentrates raised on the farm into a marketable product, the hog is by far the most valuable animal. All regions of the United States may be considered suitable for raising hogs. The feeds used to grow and fatten hogs can be produced to a greater or less extent in practically every part of the country.

Feeds can be produced more abundantly in some localities than in others. Other factors, such as markets, climate, and quality of soil, also should be studied. It is best to start with but a few sows. As the herd increases in numbers a careful study of the farm should be made to determine what crops it will produce most successfully and how and to what extent hogs fit into the general plan for that particular farm.

It is always advisable to use purebred animals in founding a herd. Much time and money are lost by starting with low-grade sows and building up the quality of the herd by the use of purebred boars.

The 4,000 cars of Yakima apples in storage at the first of the year are equivalent to 3,024,000 boxes. The increased price of 35 cents a box, due to the rising market, swells the value of the 1924 crop by \$1,008,400, bringing the grand total value of apples to \$13,363,900.

Increased prices for Yakima agricultural products in storage at the first of the year, but recently moving steadily to market, indicate that at least \$1,250,000 will be added to the 1924 crop total if recent prices are maintained until the cleanup of the crop.

## QUALIFICATIONS OF A CANADIAN FARMER

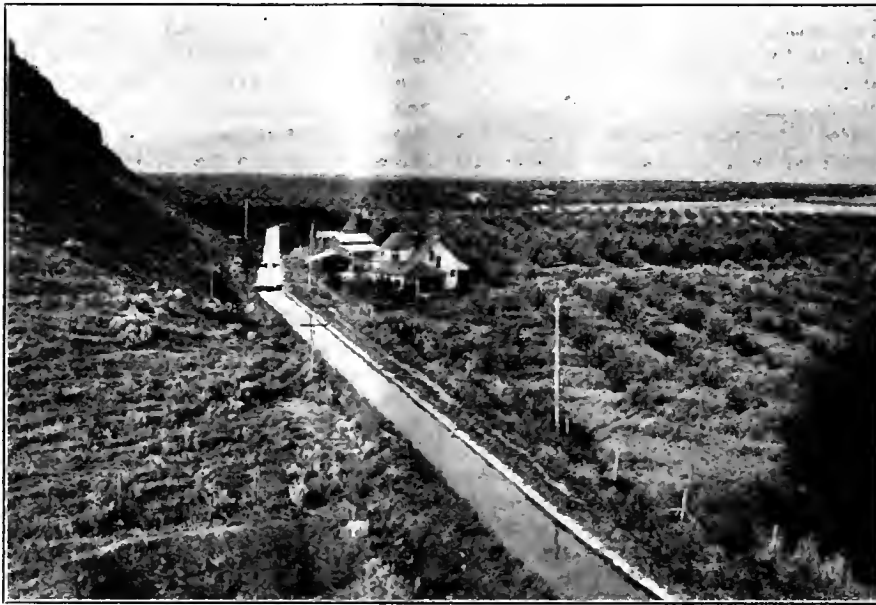
Under the subhead "Industry and thrift," a pamphlet issued recently by the Department of Immigration and Colonization of Canada on the general subject of assisted settlement of approved British families on Canadian Government land, stresses industry and thrift on the part of the prospective settler, as follows:

A settler can commence farming in Canada with little personal capital and with small farm experience, and can make good, if he possesses the will to work and applies himself.

The man who is willing to work—when a cash wage is not available, for anything that is of use to him on his own farm—never fails. No applicant will be approved who can not prove clearly, from his previous life at home, that a willingness to work hard has always been one of his outstanding characteristics.

Experience and industry are of little value without thrift. Government assistance in securing a farm and equipment will not mean that any settler can expect more than the barest and most meager living until he has, himself, built up a reserve fund of his own. In the early years severe and rigid economy, which many may regard as almost privation, is the only sure way in which to assure success and substantial comforts in the later years.

Speaking generally, thrift is evidenced in two ways—first, by making a profit, or taking advantage of incidentals; and, second, by avoiding every unnecessary expense. In both aspects, the character and attitude of the farmer's wife are of the greatest importance.



Vista from Round Top Hill, Okanogan project, Washington

## EVERY FARM NEEDS A VEGETABLE GARDEN

Every farm should have a good vegetable garden. There is no piece of ground on the farm which can compare with the garden as a source of profitable returns for the labor expended. Half an acre of garden may easily produce \$150 worth of food. The garden is one place where the middleman may be eliminated,

because the crop goes direct from the field to the consumer's table. Many a family which has not made expenses during the last few years of depressed prices has lived on the fat of the land and without a store bill by means of a garden.

Our forefathers used to take tonics to tone them up in the spring. They felt the need of those vitamins which fresh vegetables supply, though they could not call them by name. These days we put away the medicines and eat asparagus, lettuce, radishes, and spinach.

Both good health and bank accounts are augmented by a garden.—*North Dakota Agricultural College Circular 58.*

## AUSTRALIA GETS BRITISH SETTLERS

A recent press dispatch states that a definite agreement has been reached providing for the movement of 450,000 settlers from the United Kingdom to Australia, involving the expenditure of \$300,000,000 over a period of 10 years.

The Australian Government has agreed, it is stated, to raise immediately loans amounting to \$170,000,000 to be expended in rural development, clearing the land, and assisting settlers during the first 10 years.

The British Government proposes to assist 34,000 families, averaging 5 persons each, to sail for Australia and take up homesteads. Emigrants need not possess any capital whatever to take advantage of the scheme. Their passages will be paid and they will receive technical training, machinery, and periodic payments during the first five years.

## IRRIGATION DISTRICTS INCREASE IN NUMBER

The extent of irrigated land under irrigation districts is increasing at a rapid rate, according to an article in a recent issue of the "Irrigation Review" by Samuel Fortier, of the United States Department of Agriculture. All of the 17 Western States now have irrigation district laws, based primarily upon the original Wright Act of California. These laws differ in many essential details; but they all provide for a type of organization that is a political subdivision of the State, that may issue bonds, and may levy assessments which become liens upon the lands of the district.

To January 1, 1922, there had been formed, in the United States, 598 such districts, of which number 80 per cent, or 478 districts, had been formed since 1908, or in the 13 years ended with 1921. In the two years 1919 and 1920, 156 districts were created, or more than one-fourth of the total number. These figures show that although the earliest district law (the Wright Act of California) was passed in 1887, by far the greatest activity has taken place in very recent years.

More than \$280,000,000 of bonds have been voted by these districts, of which nearly \$105,000,000 were outstanding January 1, 1922. These districts have covered nearly 16,000,000 acres of land, although of this amount some 4,500,000 acres are included in districts no longer active. It is estimated that in 1921 irrigation districts irrigated 2,857,400 acres of land.



Field prepared for planting cauliflower on the Rio Grande project, New Mexico-Texas.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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Rio Grande	El Paso, Tex.	L. M. Lawson	V. G. Evens	L. S. Kennicott	Ottamar Hamel <sup>1</sup>	El Paso, Tex.
Riverton	Riverton, Wyo.	H. D. Comstock	R. B. Smith	V. E. Hubbell	Brooks Fullerton	Mitchell, Nebr.
Salt River <sup>2</sup>	Phoenix, Ariz.	C. C. Cragin <sup>3</sup>				
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Williston	Williston, N. Dak.	W. S. Arthur	W. S. Arthur	H. C. Melaas	E. E. Roddis	Billings, Mont.
Yakima	Yakima, Wash.	J. L. Lytel	R. K. Cunningham	J. C. Gawler	H. L. Holgate	Portland, Oreg.
Yuma	Yuma, Ariz.	P. J. Preston	C. A. Denman	E. M. Phlebaum	R. J. Coffey	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls	American Falls, Idaho	F. A. Banks <sup>4</sup>	H. N. Bickel	O. L. Adamson	B. E. Stoutamyer	Boise, Idaho.
Umatilla, McKay Dam	McKay Dam, Oreg.	R. M. Conner <sup>5</sup>	C. B. Funk	W. S. Gillogly	H. L. Holgate	Portland, Oreg.
Yakima, Tilton Dam	Rimrock, Wash.	Walter Ward <sup>4</sup>	M. J. Gorman	C. F. Williams	do.	Do.

<sup>1</sup> Attorney.

<sup>2</sup> Project operated by Salt River Valley Water Users' Association

<sup>3</sup> General Superintendent and Chief Engineer.

<sup>4</sup> Construction Engineer.

<sup>5</sup> Superintendent of Construction.

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*F*ARMING under irrigation may and does use practically every approved farm tool found desirable under humid conditions. Every refinement known to agriculture may be practiced with profit by the farmer under the ditch. Plowing at the correct time, to the best depth, and by the accepted methods lies at the foundation of successful irrigation farming. To plant correctly; to supply the plants with sufficient food; to remove weeds; and to harvest wisely—are all practices to be observed as carefully by the irrigation farmer as by the rainfall farmer.

The special tools and devices for irrigation farming are those only that are used directly for the distribution upon the land of water from the canal and the conservation of it in the soil.

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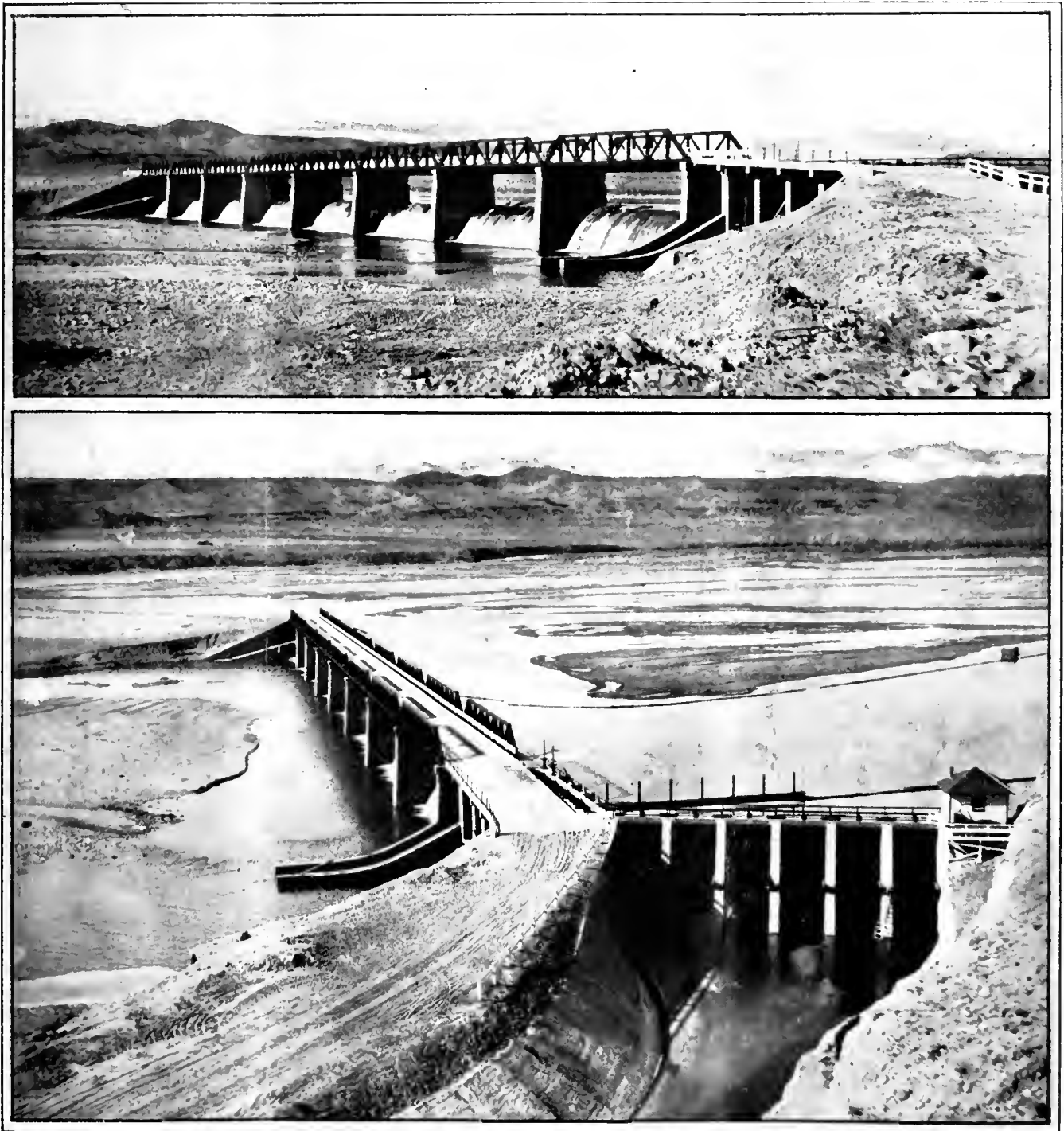
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# NEW RECLAMATION ERA

VOL. 16

JUNE, 1925

NO. 6



WIND RIVER DIVERSION DAM, RIVERTON PROJECT, WYO.



*IT HAS BEEN FOUND THAT THERE HAVE BEEN REQUESTS FOR WHOLESAL RELIEF IN WHICH ENTIRE IRRIGATION DISTRICTS COMPOSED OF HUNDREDS OF FARMERS HAVE ASKED THAT THEIR CHARGES BE JOINTLY SUSPENDED. WE CAN NOT ACCEDE TO REQUESTS FOR BLANKET RELIEF. IN MANY OF THESE DISTRICTS THERE ARE FARMERS AND FARM OWNERS WHO RENT THEIR LAND AND OTHERS WHO ARE PROSPEROUS. IT WOULD BE MANIFESTLY UNJUST TO THEIR NEIGHBORS WHO CAN NOT PAY AND TO THE GOVERNMENT TO PERMIT THEM TO ESCAPE PAYING THE CHARGES DUE TO THE GOVERNMENT UNDER CONTRACT WHEN ABLE TO DO SO. THE GOVERNMENT MUST KEEP ITS CONTRACT WITH THE SETTLER AND HE IN TURN WITH THE GOVERNMENT.*

*THIS DOES NOT MEAN THAT RELIEF TO INDIVIDUAL FARMERS IS BEING DENIED. EVERY APPLICATION IS RECEIVING FAIR AND EQUITABLE CONSIDERATION. ANY SETTLER ON ANY PROJECT PRESENTING REASONABLE PROOF OF HIS INABILITY FINANCIALLY TO MEET HIS PAYMENTS IS BEING GRANTED AN EXTENSION OF TIME EXPECTING THAT HE WILL EVENTUALLY PAY HIS OBLIGATIONS TO THE GOVERNMENT AS PROVIDED BY CONGRESS.*

*HUBERT WORK,  
SECRETARY OF THE INTERIOR.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

JUNE, 1925

No. 6

## BROADENING THE SCOPE OF FEDERAL RECLAMATION

*A discussion of new ideas and agencies for the settlement of unused agricultural land and the creation of new communities.—  
The changes wrought and plans for future development*

*By the Secretary of the Interior*

ANY organized movement having for its purpose the improvement of farming conditions and the broadening of opportunities for farm ownership may be assured of support. I grew up on a farm and have retained an interest in good cultivation and good livestock. I realize how important it is to the stability of this Government that we create conditions which will hold and attract to the land people of equal intelligence, virtue, and interest in public affairs with those who live in the city.

That the conditions suggesting our investigations to determine the changes needed in reclamation policies in the arid region, and the incorporation in the bill providing for these changes a paragraph which authorizes the expenditure of \$100,000 in a study of the problems of reclamation and land settlement in areas outside of the arid domain may be more fully understood, the connection of the Interior Department with land settlement and the results of the first twenty-two years of the operation of the reclamation act should be known. With these as a background I may be able to present a conception of what changes are being wrought in the administration of the reclamation act by the bureau in charge, and what we hope to see achieved in the future.

The Department of the Interior, through the General Land Office, one of its bureaus, had jurisdiction over the greatest area of fertile land ever controlled by one civil polity. If Alaska is included in the United States, the total was, in round numbers, 1,800,000,000 acres, of which nearly 1,300,000,000 acres have been disposed of. Although the Interior Department has exercised control over the survey and disposal of these lands, the Government of which it is a part has never had a land-settlement policy. By that is meant that there has been no law and little attention given to the creation of organized and permanent communities and to fostering a kind of agriculture which would conserve

the fertility of the soil and its other resources.

Public land was first regarded as a resource from which funds could be obtained to replenish an empty treasury, and to do this land was sold in areas of any size and to whosoever wanted to purchase. What was done with this land or the conditions on which its owners and cultivators secured it were all matters outside the domain of public interest. The homestead act had in it a truer conception, but because it differed from the old speculative and revenue idea it was denounced as socialistic when introduced in Congress. It was, however, only suited to the fertile humid sections of the country, where agriculture could be established without organization and without the large preliminary outlay applying to the arid region, where settlement was necessarily preceded by the construction of irrigation works.

Other acts were makeshifts. There was a reluctance in Congress to enter into the problems of the individual settler. What most States desired was to get the land into private ownership so it could be taxed. There was no organization; there was no attempt to create a rural life suited to the conditions of the future and lay a permanent foundation on which our civilization might rest for generations. The wave of settlement which crosses the Alleghanies and swept on to the Pacific developed in people a migratory and speculative state of mind. No sooner was a house erected and fences built than the settler was eager to find a buyer so that he could go farther west and again share in the riches which he believed lay on the frontier. Valuable features of New England life which were incorporated in the settlement of that section were ignored or forgotten. There was no laying out of villages to provide for convenience of intercourse, no attempt made to choose adaptable people for the soil or to establish permanent agricultural practices.

Western life was virile and active and created a rampant individualism, but it was destructive of natural resources. It adopted methods of mining of the soil's fertility, it ignored the ultimate disastrous consequences of taking out of the soil without putting in, of land speculation, and inflation of farm prices. When finally the fertile public land was all gone and the door of opportunity opened by free land was closed there was nothing to take its place.

The first attempt at a new policy was the passage of the reclamation act in 1902. It had become evident that the building of irrigation works was beyond the means of the individual. It had not proven profitable by private enterprise, and so the aid of the Government was enlisted, but this act was defective in the limits of what it provided and what the public then regarded as necessary.

It was believed that if canals were built agriculture would follow; that settlers would flock to these lands, and in some undefined way carry out the costly and difficult task of clearing off the sagebrush, leveling the surface, providing the farm buildings, the implements and livestock, and doing all those things that go into the change of the sagebrush desert into the productive farm.

The generous terms of payment for a water right—twenty years without interest—made this domain a fruitful field for the land speculator, and the result was an early and disastrous inflation of prices on land in private ownership. More than two-thirds of the lands under the works heretofore built were in private ownership when they were inaugurated. The political pressure to have works built in the different States, regardless of cost or the productive value of water, determined the location of many, and as a result canals were built to water unfit land and where the cost of development was more than agriculture could stand.

(Continued on page 82)

## PERNICIOUS PRACTICE OF NOT PAYING THE GOVERNMENT

*Necessity of meeting other debts carrying a high rate of interest led settlers to disregard the claims of the Government which bore no interest*

(Continued from page 81)

If this had been a real home-making institution as advertised, provision would have been made to enlighten settlers regarding these matters, but there was no selection of settlers. There was a ruling that the act did not permit the employment of people to give practical advice about how to prepare the land for cultivation or instruct the beginner to whom conditions were new as to what crops to plant and when to plant them. It was exclusively a construction agency, with the social and human requirements ignored in the act and neglected in its administration. The result was that some of the land was acquired by people who never were farmers and never expected to be, while the real farmer, who took his family into this new domain with his money and experience, had a faith and confidence in the Government that it would not have spent all the immense sums required to build these works unless it was to create conditions where he could make a living.

When he tried and failed his faith in our institutions was shattered, and a succession of such failures has eliminated blame from the individual and fastened it onto the system or conditions under which the uninformed and oversanguine individual undertook to create a home. Instead of being the open door to farm ownership many of these projects have been the scene of heartbreaking experiences to settlers and their families, leading to failure and the loss of their land and of their reliance on the Government to keep faith with them.

Settlers who entered on these projects under the impression that they were obtaining a farm practically free of cost found that it cost thousands of dollars to do the preparatory work. Lacking the capital themselves, there was no credit agency from which they could obtain money on terms suited to the undertaking. They could only borrow on short-time payments and at ruinous interest rates. Eight and twelve per cent is being paid on many of the projects for the money borrowed to level the land, build houses, and buy livestock.

As a result, two years ago, I found that the pernicious practice had grown up of not paying the Government for the service it rendered in providing water, because postponement of that payment did not increase the debt since it bore no interest, and there was on the projects a continued pressure to pay the local banker and

storekeeper and let the Government wait. What I confronted has been so well stated in a letter received by the Commissioner of Reclamation that I intend to quote three paragraphs. The writer is a professor in one of the State universities in the Middle West, but knows from practical experience the conditions which have confronted settlers.

"All of this sad state of affairs could have been wholly or largely avoided by making the operations of the Reclamation Service cover not only the investigation, design, and construction of projects from an engineering standpoint but from the humanitarian standpoint to investigate and decide whether, water once brought to the lands, it would pay the average individual to attempt to farm them.

"What waste of effort, money, toil, and the best years of many men's and women's lives might have been prevented on the ——— project and the ——— project, for example, if in the first place these projects had never been developed, but, granting that they would have been developed anyway for political reasons, who could measure now what it would have meant to those bitter, disillusioned, and bankrupt people if they had had then a certain amount of friendly counsel in selecting lands, in growing the right kind of crops, and in irrigating to prevent ruination of land, besides financial assistance in those first lean years in clearing the land, getting in the first crop, building houses and sheds, and generally helping the man to accustom himself to his new environment and occupation.

"I am opposed to paternalism in government and I believe that the future of this country depends upon freedom in the development of individual initiative, but if it is necessary to adopt a certain paternalistic policy in establishing successful settlements upon our irrigation projects (and I am sure that a certain measure of help is desirable), then I should say that we should go to any length of paternalism to prevent hereafter the melancholy spectacle of a whole community of Americans so thoroughly disheartened, disillusioned, and beaten as to be actually rebellious and ready to listen to any crazy agitator who would attack the good faith of our Government and advocate the repudiation of all debts owed to it."

When I became Secretary of the Interior it seemed that the first step was to ascertain the facts. I could not do this alone and so appointed a Fact Finding Commission, made up of men from different fields of activity, who could consider reclamation from the human and economic standpoint as well as in its construction and financial aspects. The report of that committee stressed the need in future development for more careful study of those conditions on which the welfare of the family

and the agricultural prosperity of the community would depend before any project was started. They stated that no project should hereafter be undertaken where the cost of the developed farm would be greater than its productive value. That even if the Government built the works the remaining expenditures involved in changing raw land into farms are too great for the capital of those likely to be willing to do this pioneering, and that in order to enable men of small means to succeed these things should be provided:

First, that there should be farm workers' homes for those who have no capital. This would give to people who worked for wages homes where much that they consumed could be grown. It would put the wife and children in a position of security and independence that is sorely needed in the rural life of America to-day and would add to their enjoyment of life in the open country. This is something we have ignored but which must be provided if community life is to continue to be an economic success.

For the farm owner there is need that he should have some capital, but equal need that he be able to secure advances in the form of loans to complete the development of the farm.

If there is to be no waste of time and effort, these people coming together from widely separated localities and entering on this enterprise in localities where conditions are strange and new should have intelligent advice and direction from those who understand local conditions. In this way an appalling waste of time and money and misdirected effort will be avoided.

The advantage of this detailed care in placing settlers on the farms and supervising their development is that it would bring into the service men of greater agricultural and economic experience; but if we were to create communities organized to provide for the needs of all classes of people who make up rural life and help them to cooperate in business and social affairs we would be solving a problem in which the local town and the whole country is interested. It would be undertaking a difficult task.

We are confronted to-day by an exodus from the country to the city of the ambitious and aspiring. More than half of our people already live in cities and

(Continued on page 83)

## BROADENING SCOPE OF RECLAMATION

(Continued from page 82)

towns. We can not accomplish a back-to-the-farm movement, but we can foster a stay-on-the-farm atmosphere. We have the problem of how we are to retain the farm-born boy and girl on the land, which applies to the South and East as well as the West.

What we need is a combination of State and Federal policies and a recognition by both the States and the Nation that we have here a problem which requires the interest and effort of our ablest minds, a policy which is national in the truest sense.

There was secured through the Fact Finders' bill an appropriation of \$100,000 for investigations of the conditions necessary to settlement and reclamation in the unpeopled and thinly peopled areas outside the arid domain. It is my belief that if this appropriation were used to investigate how to drain a particular swamp or blast out or pull out the stumps on a particular area and then leave the settlement of the lands made available to the unplanned, unaided settlement methods of the past it would simply be adding a new area to be ex-

ploited by absentee speculative ownership, inviting waste of energy and money.

This money should be so expended as to secure a working knowledge of the conditions in sections of the country where land settlement is now recognized as a national problem. Such public opinion exists in North and South Carolina, where able men are already engrossed in this study and where commissions have been created to gather data at home and abroad. If our department can arrange to make a study of the locality best suited for the building up of new farm communities, of the methods which ought to be adopted as the basis for this development, so that we can build up a farm life full of opportunity and create homes which will be the permanent inheritance of the children and children's children of their founders, I shall regard the expenditure of this money as one of the most helpful and worthy endeavors of the Department of the Interior.

Proposals for investigations in any part of the country to determine how best to reclaim, people, and develop waste or neglected lands will therefore be welcomed.



Strawberries add many a dollar to the farmer's income

## FINANCE CORPORATIONS IN MILK RIVER VALLEY

An interesting development in connection with the sugar-beet industry on the Milk River project has been the organization of two finance corporations capitalized at about \$30,000 each. The Upper Milk River Valley Finance Corporation, with headquarters at Chinook, includes the territory between Lohman and Dodson; the Lower Milk River Valley Finance Corporation, with headquarters at Malta, includes the territory from Dodson to Nashua.

The purpose of these organizations is to finance labor for the sugar-beet growers up to \$12 an acre, also to finance the transportation of sugar-beet workers. An agreement has been made with all of the sugar-beet growers to deduct 50 cents a ton from each ton of sugar beets grown for the purpose of financing railroad transportation for the workers. This amount is, of course, advanced by the finance corporations and will be returned to them by the sugar company.

At first it seemed that it would be impossible to interest the growers in paying 50 cents a ton, but when they were shown that last year they paid out more than \$1.50 a ton in freight to ship their sugar beets to Billings, and that it would be necessary to continue this for another year or two unless they were willing to cooperate in the financing of transportation for sugar-beet workers, they very soon consented to contribute the 50 cents per ton and get the factory right away.

The sugar company would not undertake to supply the labor for the reason that it was necessary to import about 90 per cent of the hand labor required for this year's crop, and they considered this too much of a responsibility together with the erection of a new factory. It is working out very well, however, and the most fortunate thing that they ever did was to organize these finance corporations. The stock is subscribed to by about all the business men, banks, and individuals, so that if there is any loss it will be very light to each one.

It would have been utterly impossible to have raised the funds to handle the sugar-beet laborers had they not hit upon this finance corporation plan.

The Danish farmer makes agriculture a business, and it is a business that is organized into hundreds of cooperative associations for buying fertilizers and foodstuffs, for selling products, for making butter and cheese, and for breeding cattle and horses.

## TENTATIVE PLAN TO OBTAIN SETTLERS ON PROJECTS

*The following tentative plan to fill up the gaps on available farm units on existing irrigation projects of the Bureau of Reclamation has been prepared with a view to eliciting general discussion of this problem*

A CONFERENCE held at Chicago in March, 1925, by Secretary Work and Commissioner Mead with representatives of several railroads (see April, 1925, issue of NEW RECLAMATION ERA) disclosed that to settle adequately existing reclamation projects and the new projects recently authorized by Congress will require approximately 17,000 additional settlers. The new projects present special problems and will not be considered in this discussion. The existing projects scattered throughout fifteen of the seventeen western States all require additional settlers. Some of them are obtaining settlers in considerable numbers; on others settlement is practically at a standstill.

The Rio Grande project in New Mexico and Texas obtained about 600 settlers last year through the activities of the Gateway Club of El Paso, Tex., the Chamber of Commerce of Las Cruces, N. Mex., and the Santa Fe Railroad. These organizations have gotten out attractive literature and are advertising in 512 periodicals and newspapers circulating generally throughout the agricultural sections of the United States and Canada. The results obtained are gratifying, but many communities could not afford such an ambitious program.

### ORGANIZATION ESSENTIAL

It is believed that an organization can be perfected and a plan outlined which

will function satisfactorily on each project. The organization and plan must be the result of complete cooperation of all local interests in order that the population of both towns and country will be entirely and wholeheartedly behind it. To this must be added options or contracts for exclusive sale of lands and listings of farms for sale which offer a variety of opportunities to intending settlers. There must be no question in regard to the opportunity offered. Each farm must be worth the price asked and suitable for settlement. There is no place for the speculator in this program. With these two things accomplished full cooperation of the railroads, sugar-beet companies, State colonization agencies, and the Bureau of Reclamation can be anticipated.

### A GENERAL COMMITTEE

In order to bring about the organization of the community the general program of putting a settlement campaign into effect should be in the hands of a General Committee to be composed of the secretary of the Chamber of Commerce, the county agent, the president of the Farm Bureau, the project superintendent, one or two interested bankers, a newspaper editor, a representative of the State grange, a representative of the realtors, an enterprising merchant, a representative of the sugar factory or other industry related to farming and two or more farmers. These men should be chosen carefully for their

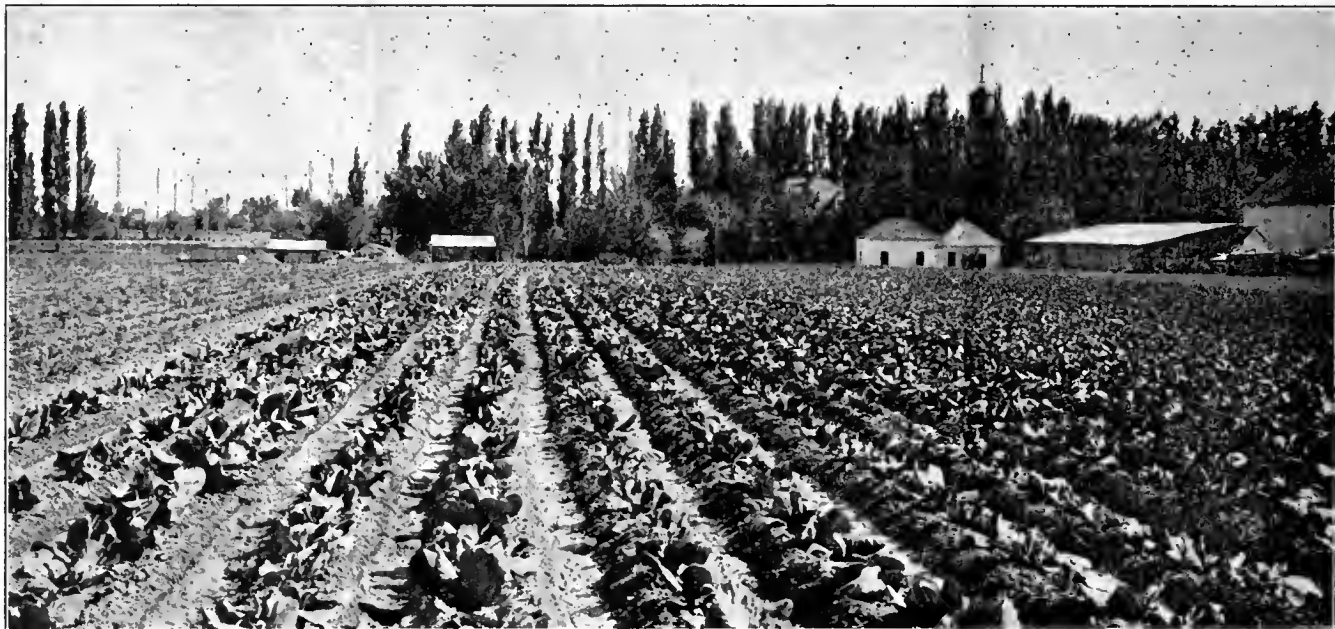
interest and their knowledge of the problems of farming and their desire to build up the community. They should be known for their integrity, business sense, and public spirit.

### COMMUNITY SPIRIT NEEDED

The General Committee should hold meetings throughout the community and explain the plan to be followed. The General Committee should seek to build up the friendly interest and obtain the cooperation of farmers and business men in the plan. To be successful the community must be solidly behind the program. All must realize that if new settlers are to succeed they must be made welcome, must be given an opportunity, and must be encouraged by their neighbors and their newly formed business connections. Nothing is more valuable in a community building program. Without this spirit of confidence, failure is certain. The General Committee would also have charge of raising the necessary funds to pay for necessary printing and moderate advertising expenses.

### FARMS MUST BE APPRAISED

A form should be sent to all owners of land on the project who desire to sell, particularly to the owners of land who do not reside on their farms but who desire to sell their properties, upon which form the owner shall describe the lands he has for sale, with a list of the improvements,



Truck gardening on the Boise project, Idaho



and state the purchase price desired and the terms of sale. He should also state whether he would be willing to give an option to the General Committee running for a period of one or two years.

An appraisal committee composed of the project superintendent, the county agent, and one of the best farmers of the project, none of whom should have any land to sell, should go over these options and listings and carefully appraise the properties on the ground. They should examine the soil and determine its productive value, carefully list and appraise the improvements, determine the area leveled and graded and the kind of agriculture most likely to succeed on each property, and other pertinent facts that should be made known to the intending settler. Thus the appraisal committee will arrive at an unbiased appraisal of the true worth of each property.

If the owner's selling price is in excess of this committee's appraisal, he should be encouraged to reduce it to the committee's valuation. If the owner is unwilling to do this, his farm should not be offered for sale by the General Committee. The value of the property is not the only important item; to the new purchaser the terms of purchase are quite as important. The General Committee should, therefore, be sure that the terms of purchase are suitable to meet the intending settler's present means and the earning power of himself and his family after he has purchased the farm. If the lands are heavily mortgaged, care should be exercised to see that the mortgagee will transfer the mortgage to the new purchaser under repayment terms and interest rates which the agriculture of the region can bear. It

can readily be seen that it would be a calamity to sell a farm to a purchaser attached to which is a mortgage with a short repayment term and bearing interest at 8 or 10 per cent.

#### BOOKLETS TO BE ISSUED

From the options obtained approved farms should be described in detail in a small booklet. These descriptions should include the area of the farm, its irrigable acreage, the price per acre, and the terms of purchase, the kind and character of house and out buildings, the kind of domestic water supply, the crops that can be successfully grown, stating how many acres are leveled and under ditch, the taxes and irrigation charges, the distance of the land from schools, shipping points, towns, and other essential facts. The booklet should recite that the plan is in charge of a General Committee, the personnel of which represents the highest types of men, interested only in building up the community by safe and honest methods. It should also be stated that the lands have been appraised by a disinterested committee of trained and experienced people who have nothing themselves to sell.

These farms should be tied up with an option of purchase running to the General Committee for a period of from one to two years in order that the organization can deliver the farm to the new purchaser, who, in many cases, will have traveled a considerable distance and will have spent a considerable sum of money to inspect the properties. Some owners will not care to tie up their lands by such an option, but would be willing to list

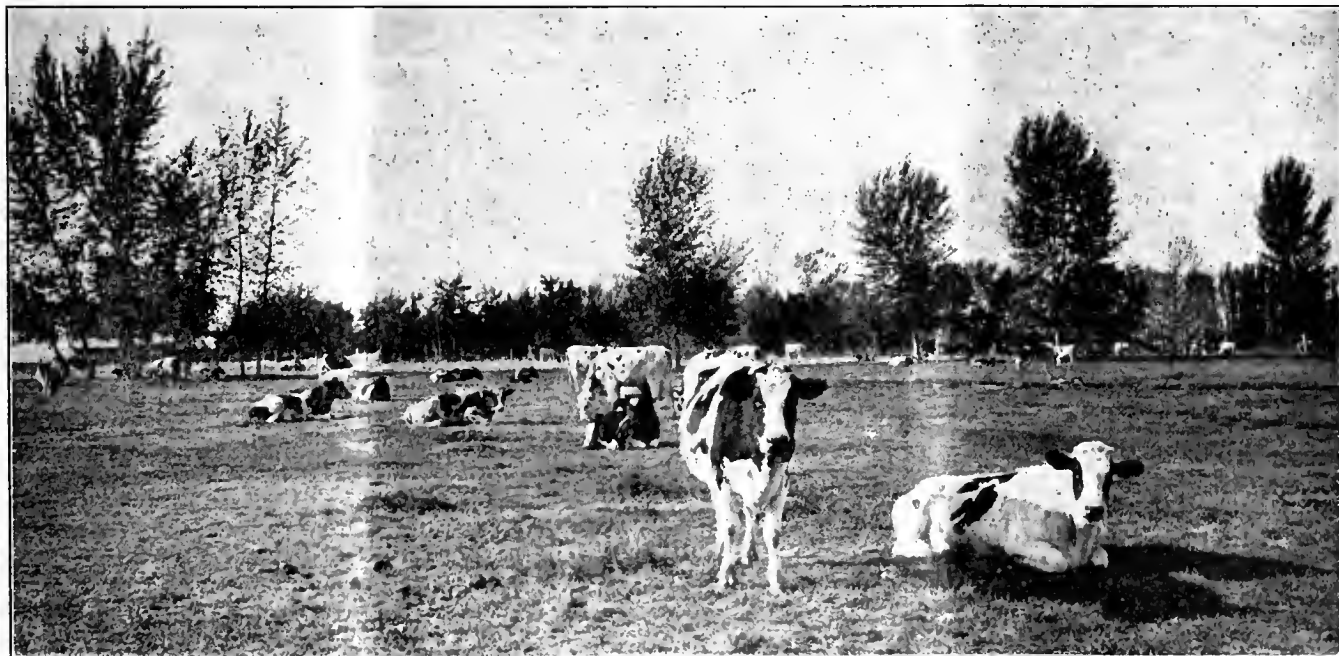
them with the General Committee. Such farms would not be advertised in the booklet, but could be offered to settlers, provided the General Committee approved the selling price, the terms of sale, and other conditions.

The advantage of a booklet as described, offering perhaps 50 farms carefully selected, is that each one is a definite thing. It would be a catalogue of definite opportunities. Such a booklet has a great deal more value than mere general descriptive matter. These booklets might be given free distribution by the Bureau of Reclamation, by the interested railroads, and by other industries interested in the locality. "The 50 opportunities" could be advertised in a few carefully selected newspapers and periodicals circulating throughout the section of the country from which it was expected to draw settlers.

#### COOPERATION WITH REAL ESTATE AGENTS

The options and listings could be made available at the various real estate offices on the project under an agreement whereby the realtor, if sale was made would turn in 25 or 30 per cent, or an amount to be agreed upon, of his commission to the General Committee for the purpose of partly defraying printing, advertising, and other expenses. It must be understood, however, that the new settlers should receive some consideration by the appraisal committee whose duty it would also be to interview them and pass on their fitness for the undertaking. In other words, the settlers should be

(Continued on page 86)



Blooded dairy stock on the Boise project, Idaho

## NEW SETTLERS NEED GUIDANCE, ADVICE AND CREDIT

*New settlers are in particular need of financial and agricultural program in order to avoid costly mistakes. Various forms of credit may be made available*

(Continued from page 85)

selected, and while the appraisal committee could not be in session all the time the project superintendent could, in most cases, perform this duty for the committee. No settler should be encouraged to buy who has not a reasonable chance of succeeding. In addition to the advertising the General Committee should canvass the project and encourage each farmer and business man to send the booklets to some of his friends or acquaintances in other sections of the country. If farms are properly appraised, farmers and business men will be glad to do this.

### EFFECTIVE WORK NEEDED

The success of such a plan will depend entirely upon those interested in carrying it into effect. It will not run itself. It will be just as effective in building up the community as the community is in putting it into effect. The program, as provided, safeguards the settler from speculative prices, it offers to him an opportunity in keeping with his limited means, it puts into effect a cheap form of effective advertising, and will, if carefully administered, bring results.

### NEW SETTLERS SHOULD BE GUIDED

No plan of settlement would be complete without some thought given to the guidance and advice new settlers should receive after they purchase their farms. Every farmer must have a financial and agricultural program. New settlers are in particular need of it. If the new settler is not helped in this respect he will make costly mistakes. He should be advised on the kind of crops to be planted, where he can buy satisfactory seed, and the time and methods of planting. He should also be advised where he can buy tubercular-free animals of high production, the kind of farm buildings needed, and the cheapest and most satisfactory material required for their construction. A satisfactory crop rotation should be worked out. There is nothing so valuable as these "tips" to the newcomer when given by some one who knows and whose judgment is sound. If the number of settlers obtained is small no doubt some attention could be given to this work by the project superintendent, the county agent, and perhaps a good farmer in the vicinity. If the new settlers come in considerable numbers these agencies could not give these things adequate attention, and sooner or later some person of outstanding ability would have to give full time to the work. The plan would no

doubt work out much better if from the start a good man could give full time to the work under the guidance of the General Committee. There is nothing of more value in a successful settlement program than to assist the new settler in becoming thoroughly established.

### OBTAINING SUITABLE CREDIT

On some projects the Federal farm loan system of credits is in operation. Generally on such projects short-time credit is adequate and may be secured for 7 and 8 per cent. On other projects these are not the conditions. The farm loan system is not functioning and mortgages bear 8 to 10 per cent, with ruinous commissions for renewals. On such projects short-time credit bears 10 per cent interest. Settlers are needed most where credit conditions are the worst.

### OPTIMISTIC OUTLOOK

*Agriculture has entered the new crop season with good prospects for a more prosperous year. The pressure of hard times, though still in force, has relaxed somewhat, and farmers are in a better frame of mind than last spring, according to the May 1 agricultural review of the Department of Agriculture.*

Three members of the General Committee should study the peculiar credit needs of the community, and especially of the new settler, and make plans for adequately meeting them. Credit facilities should be thoroughly canvassed by this committee and the information arranged for ready reference so as to be available to the prospective settler and to the present settler as well. The first effort should be to convert the high interest-bearing real estate loans into amortized loans with a lower rate of interest. One project, through its bankers and other interested citizens, has already made progress in this respect.

A form of credit not yet made general use of on the projects may be obtained through the Federal intermediate credit banks authorized by the act of Congress approved March 4, 1923 (42 Stat. 1454). Intermediate credit is neither short nor long, but, as the name implies, between the two; that is to say, from six months to three years. Such credit is particularly suited for the raising, fattening, and marketing of livestock. If an agri-

cultural credit corporation or an incorporated livestock loan company is organized with a paid-up capital of \$25,000 it may rediscount its loans with the intermediate credit bank not to exceed ten times its paid-up capital and surplus. In actual practice, however, the expansion of credit is not so great. Much depends on the integrity of the official personnel and financial standing of the corporation. Other financial institutions are making use of this form of credit. It is entirely possible to make full use of this form of credit on many of the projects.

The new settler should have money enough to make his initial payment, buy equipment, seeds, and pay his first year's operating expenses. He rarely will have enough capital to purchase livestock when his feed situation demands it. If he purchases dairy cattle and is obligated to pay 10 per cent interest on the loan and must turn over one-half of his cream check to the mortgagee some of his other bills will go unpaid. Settlers can not pay the balance owing on their farms, taxes, water charges, and make needed improvements and part with one-half of their cream checks at the same time. Agriculture never was, and isn't now, profitable enough to do this. Dairy loans should be divided into 36 monthly payments, with interest at 6 per cent. This kind of credit would build up good herds of cattle and flocks of sheep, and attention could be given to their breeding and health, because it would be a permanent industry.

Bankers with whom this situation has been discussed are anxious that their clients have suitable long and intermediate credit. They can be relied upon to help. The special committee having this problem to solve should be headed by a progressive banker.

The Division of Reclamation Economics of the Bureau of Reclamation will be glad to assist any of the projects in formulating plan of settlement and help work out ways and means of putting it into effect. Some modification will, no doubt, be necessary to meet local conditions, but it is believed the general principles laid down are sound. Constructive criticism and helpful suggestions from the readers of the NEW RECLAMATION ERA are earnestly invited.

Steady employment and better living conditions for farm laborers and their families are necessary to attract capable employees to farm work.

## WHAT IS THE VALUE OF A SETTLER TO THE RAILWAYS?

*An interesting discussion by a number of representatives of western railroads serving the projects, based on the estimate of \$746.33 as the gross value, made by the Canadian Pacific Railway Co.*

**I**N a recent report of the Soldier Settlement Board of Canada the statement was made that the Canadian Pacific Railway estimates that every producing settler is worth \$734 to the railways alone each year. The railway was asked to analyze this figure, and this was furnished as follows:

The sum of \$746.33 represents the gross value of a settler to the railroads, and is arrived at in the following manner. During the five-year period 1916-1920 the gross income of the railways in the Prairie Provinces was \$823,970,326. Only four items are taken into consideration in compiling this figure, namely, agriculture (horses, cattle, sheep, pigs, wheat, oats, barley, and flax), coal, and in and out going passenger revenue. On the basis of 219,105 farmers in the area—1916 figures—and the division of one total by the other, we arrive at a figure of \$746.33, the settler's gross value to the railway. This does not take into account the railroad's cost or show the railroad's profit, the \$746.33 just showing the total earnings per farmer. If we take the gross from the net income for the years 1916 to 1920, inclusive, we find the percentage of net income 23.8 per cent—\$177.62 per annum on each farmer.

Representatives of several of the western railroads serving the projects of the bureau were requested to comment on this estimate, and a number of interesting replies were received.

One of these representatives points out that on the basis of \$734 a year the capitalized value of such a settler to the railroad would be \$12,400, which is a much higher average figure than he thinks reasonable. He believes that it is a safe assumption that any family that sticks in a country is worth \$1,000 to the railway company as a capitalized value, and that some families are worth more than \$10,000. He concludes that to assume that every well located and established and prosperous family has a capitalized value of \$5,000 to the company along whose lines it becomes established would be to assume that the railroad would make a profit from this family of \$300 a year, which is less than half the figure given by the Canadian Pacific. However, he is inclined to think it is a reasonably fair average.

Another agricultural representative of a western railroad discusses the difference in types of settlers, and assumes that from a farmer located on the Canadian prairies producing a large acreage of wheat or similar crops the value to the railway might be very much greater than from an ex-soldier located on cut-over land in northern Minnesota; that the amount of products shipped by any new

settler, whether a soldier or otherwise, if located on cut-over land, is very small in comparison to a homeseeker located, for example, on the prairie lands of North Dakota or western Minnesota; that an experienced farmer moving from Illinois, Indiana, or any other State to any of the northwest States, usually has from one to two cars of emigrant movables, and in the years past has had some capital to start with, so that during the first year he is likely to have anywhere from 160 to 240 acres in crops

with a corresponding value to the railway, whereas if he is a man of very limited means and is not equipped with livestock or farm machinery it will probably require a number of years for him to get on his feet and become a producer of importance. He concludes, however, that the Canadian Pacific Railway has not over-estimated the importance of the producing settler, and that the gross returns to the railway might amount to \$750 to \$1,000 for a good, well-equipped farmer on grain lands.



Young orchards of oranges, grapefruit, and lemons, Yuma Mesa, Ariz.

### R. F. WALTER NOW CHIEF ENGINEER

*Raymond F. Walter has been appointed Chief Engineer of the Bureau of Reclamation, effective May 1.*

*Mr. Walter has been serving as Acting Chief Engineer of the bureau since the first of November, 1924, following the resignation of former Chief Engineer Weymouth. He has served in the bureau since 1903, and has been advanced from engineer to supervising engineer, assistant chief of construction, and assistant chief engineer. He was born in Chicago, and is a graduate of the Colorado Agricultural College, later taking a post graduate course in civil engineering.*

*Mr. Walter's headquarters are Denver, Colo.*

Another representative of a western railroad figures that the average settler, say in North Dakota, is good for \$250 worth of new business, and in Montana and further west he is worth \$350; another that each producing settler is worth approximately \$500 to the railroad each year; and still another that the man who is really making a farm success should be worth to the carrier line anywhere from \$600 to \$900 per year, according to the scale on which he is conducting his farm business; and that in the long run the value of a settler to a carrier line depends largely upon his ability to get right down to business and hustle. On the basis of a capitalized value of \$5,000 and a gross revenue of \$300 a year, the gross value each year to the western railroads of the 30,000 families on the projects of the Bureau of Reclamation would amount to \$9,000,000.

## PROBLEMS OF FEDERAL RECLAMATION

*If Government development is to continue, more attention must be given to its economic and human requirements—Project costs in the future will be much greater than in the past*

*By the Commissioner of the Bureau of Reclamation*

THE whole country is interested in the continuation and success of the national reclamation policy. On this depends the growth in population and wealth of some of the arid States.

Conditions created by the Great War have put an end to important irrigation development by private capital. This result has come through increase in construction cost and lessened profits of farming.

The money for building Federal irrigation works and to carry on their operation comes from the proceeds of the sale of public land, the repayment of the cost of these works by settlers, and a part of the income from oil and timber lands. About \$200,000,000 has been expended. It would take \$110,000,000 more to complete the old projects and build the new ones for which appropriations have been made.

### IF GOVERNMENT DEVELOPMENT IS TO CONTINUE, MORE ATTENTION MUST BE GIVEN TO ITS ECONOMIC AND HUMAN REQUIREMENTS

On some projects all the money owing the Government has been paid; on others the revenue derived has not even covered operating expenses. Last year one of the good projects paid 7 per cent of what it cost to operate it. Another paid only 15 per cent. The original idea of a revolving fund which would return in twenty years all the money invested so that it could be used over again has not worked out. One project that owed \$440,000 only paid \$25,000, or 6 per cent; another project that owed \$11,000 paid only \$69; another that owed \$112,000 paid \$6,000. Financial results of this kind would, if universal, soon bring reclamation to an untimely end through emptying the reclamation treasury.

While some projects pay little or nothing, others pay nearly all. Before we approve of entering on larger development, which many desire, we should know what has brought about the present situation and put our house in order to meet new obligations. This has been the task of the Secretary for the past two years.

In order to understand the situation he created the Fact Finding Commission to ascertain why there were so many complaints, why there was such irregularity in payments, and what changes ought to be made. He followed the

report of this commission with successful endeavors to secure legislation by Congress. He followed these preliminary steps by appointing a Board of Survey and Adjustments to visit projects where conditions were most unsatisfactory, and, acting on his motto that one look is better than a thousand words, he has made a 10,000-mile journey to visit a part of the Federal reclamation projects, and is about to start on another journey to visit some of the others.

### THE RECOMMENDATIONS OF THE FACT FINDING COMMISSION

The experience of the last 20 years, the conclusions [of the fact finding commission, and what the Secretary has seen on this visit seem to make clear that the reclamation law centered too much attention on construction and gave too little attention to the agricultural and economic conditions. These are the things which measure earning power and ability of settlers to pay. There was a confident but unthinking belief that the building of an irrigation canal would, of itself, create irrigated agriculture; that once this was done settlers would flock in, and regardless of whether they knew anything about irrigation farming, whether they had any money, they could, if given a piece of land, somehow dig in and succeed. Although irrigation under canals where water rights are costly requires intense culture and the growing of high-priced crops to repay the money, there was nothing in the law that would authorize the selection of settlers, nothing to inform them of what changing a piece of raw land into a farm would cost. The charges imposed on alkali flats and areas of infertile shale were exactly the same as on the richest river silt on the same project.

### LOSSES IN IRRIGATION DEVELOPMENT ARE INEVITABLE

Reclamation development has also suffered from the declaration in the reclamation act that all the money expended should be returned to the fund. Many projects were begun that required years to complete. All the earlier estimates were made when construction costs were low and usually the first part of the land settled came in under a low construction cost; when, years later, additional lands were irrigated, higher prices made costs greater, and the next unit thrown open was at a higher cost than the original

estimate and higher than the settlers on the settled part of the project were paying. With every increase in cost there had to be a boost in prices of water right so as to avoid losses. This has resulted in great inequality of burdens on the same project. Discontent on the part of settlers carrying the larger costs was inevitable, and it has created a difficult and embarrassing situation for those in charge.

### THE EVILS OF LAND SPECULATION

One reason why settlers on projects that should be prosperous are not meeting their payments to the Government is the fact that they owe private debts bearing a high rate of interest that take all the money they can spare from the operation of their farms and supporting their families. Not only is it to their interest to pay the debt that bears interest and postpone their debt that bears no interest, but great pressure is exerted on them to keep their money at home—let the Government wait. Many of these settlers' debts are due to a speculative inflation of land prices which occurred on nearly all of these projects in the early stages of development. The generous terms of payment for water rights by the Government made this a fruitful field for the land salesman who would point out that all one had to pay on the water right was a low rate of interest for 20 years and then his payments would end, and it was often whispered to the settlers that if they stood together they could succeed in having payments postponed or written off entirely. When the Secretary asked an officer of a settlers' organization why they were not doing more to meet their payments the answer was that until the Government collected its debt from France it ought not to ask settlers to pay. This does not mean that many settlers on these projects are not going through a distressing experience. They have suffered as farmers everywhere have suffered, but their trouble to-day is not so much meeting project costs as the high interest rates and the payment of principal on their private debts.

The remedy for this is not to make reclamation a credit agency but to try and work out some system for the refunding of their debts which bear 8 and 12 per cent interest. Many of them now are overdue and should be converted into long-time amortized loans bearing low



interest rates. Financial and economic relief should come from some other sources than postponement of payment of expenses for operating canals.

The Secretary has taken a decided stand in this matter. One of the projects that has never paid operating expenses is to be sold for what it will bring. Where it is known that water users are able to pay they are being pressed to pay, in justice to struggling, deserving settlers who have paid; and where there is a refusal to pay suits are being brought to collect. An end has been brought to the demoralizing practice of issuing blanket moratoriums which only pile up the debt to be paid in the future, which lets the well-to-do and prosperous escape their obligations in order that relief may be extended to those who ought to have it. Hereafter, if the view of the Secretary prevails, the relief extended will be individual and will be confined to those who can show that they have made every effort to meet their obligations to the Government.

#### ADJUSTMENT OF PROJECT COSTS

On some projects there must be an adjustment of payments and the writing off of part of the cost. It was the conclusion of the Fact Finding Commission that on some of the projects money has been spent which can not be recovered and that this loss should be admitted and the records revised to show the exact situation. This does not mean that the project costs on the good lands will be reduced. The Frannie division of the Shoshone project or the east side of the Uncompahgre project are illustrations of the need for adjustment. Here canals have been built to cover large areas of unfertile land. On the Shoshone project 200 settlers have abandoned these farms. On the Uncompahgre project there are thousands of acres that are not being cultivated and never will be. The cost of the canals to cover these areas should be written off.

#### PROJECT COSTS IN THE FUTURE WILL BE MUCH GREATER THAN IN THE PAST

It is certain that the increased cost of everything will be reflected in the future cost of irrigation works. The estimates for water rights for four new projects included in last year's appropriation vary from \$125 to \$160 an acre. That is far higher than the actual costs on any of the old projects. Hereafter the land will be classified and the cost of water rights, instead of being uniform, will vary on different classes of land, because earning power varies. On the project where the average cost is \$160 the cost of the water

right for the best land may be between \$175 and \$200.

In order that Congress might understand what would likely happen if these projects were built, four economic boards were created to study conditions and make a report as to whether they were feasible. These boards reported that, in addition to the cost of the water right, the settlers who took up farms would have to expend from \$100 to \$125 an acre for clearing the brush, leveling the land, constructing fences and farm buildings, providing the minimum of livestock and equipment, and paying expenses until crops could be grown. In other words, the settlers would have to spend from \$5,000 to \$10,000 in order to make these farms going concerns. All of these investigators recommended that there should be on every

project some one who had practical knowledge of conditions, who would act as an advisor to the settlers, telling them how and where to carry on development, what crops to grow, and where to find markets. That settlers should be required to have some capital and some experience.

#### COOPERATION BETWEEN THE STATE AND FEDERAL GOVERNMENT

It was recommended that there should be some credit agency from which advances could be made to pay a part of the development cost. A difference of opinion arose as to how this should be accomplished. One view was that the money for these agricultural needs should come out of the reclamation fund, as



Thirty acres of Irish cobbles. King Hill project, Idaho

#### LAND CLASSIFICATION SHOWS GOOD PROGRESS

The local committees, working in conjunction with the Board of Survey and Adjustments, have been making excellent progress in the classification of project lands under the provisions of subsection K of the fact finders act of December 5, 1924.

During the month of April classification was completed on the Yakima, Belle Fourche, Grand Valley, Huntley, Lower Yellowstone, and Sun River projects, and was 75 per cent completed on the Klamath and Milk River projects, and 50 per cent on the Newlands project.

does the money to build canals and reservoirs. Another view was that the time had come when the State should be called upon to make some investment and effort in a development which meant more to it than to the Nation. The State view prevailed, and on the four projects referred to there is a requirement in the appropriation that the State must agree in a contract with the Secretary to take charge of settlement, to lay out and plan the development of the farms, to furnish practical advice and direction, and advance money to complete the improvement and equipment of farms. The indications are that they will comply with these conditions and that an era of cooperative development is before us.



## PROPER BUILDING ARRANGEMENTS SAVE TIME AND LABOR

*Actual observation has shown that proper arrangement of farm buildings in many instances saves one mile of walking every day, or 365 miles per year. In 30 years this would mean more than 10,000 miles*

CONSIDERABLE study has been given recently by the department of agricultural engineering of the University of Nebraska to the arrangement of farm buildings with a view to the saving of labor, material, and the time of the farmer. Some of these studies have been incorporated in a leaflet, which is quoted below in the belief that the suggestions will prove helpful to the water users on the irrigation projects of the bureau.

The accompanying illustration represents a nearly ideal arrangement for a 160-acre farm in the prairie States. This plan was worked out for one particular farm and has been tried out on farms in several counties of Nebraska. Many points have been given consideration in planning this farmstead to make it practical and at the same time comfortable and pleasant.

The barns and yards are located east of the house so that unpleasant odors are carried away by the wind which is south and southwest in summer and north and northwest in winter. The house is on high, well-drained land, which insures a good view and prevents barnyard drainage from reaching it.

All buildings are windbreaks to adjoining yards, nearly all fences serving two lots. The yards are adjacent to the pastures and the garden close to the house. The scales are so situated as to be handy for weighing grain and stock. It is possible to drive to nearly all of the buildings without opening gates.

Each building in this arrangement is planned so as to house sufficient feed for stock in adjoining lots. Thus, unnecessary walking is eliminated, and the man who does the chores has only to follow a

general path around the group of buildings, as shown by the dotted line in the illustration.

When a man starts doing chores in the morning he goes from the house to the barn, where he tends the horses, colts, cows, and calves, separates the milk, and feeds the calves. He then takes the remaining skim milk to the pigs at the farrowing pens, and goes to the combined crib and granary to feed the fattening hogs and fat cattle. In returning, he passes the hay shed and feeds the stock cattle and then the poultry. He steps into the milk room at the barn, gets his cream, returns to the house, and the chores are done. He has walked only 750 feet. When two men are doing chores one goes to the barn and one takes care of the outside stock.

Suppose it is evening and the farmer is coming through the lower gate by the hay shed. His course to the barn leads past nearly all of the buildings, and most of the chores can be done while the team is reaching the tank, drinking, and going to the barn. When the horses and cows are attended to the chores are done.

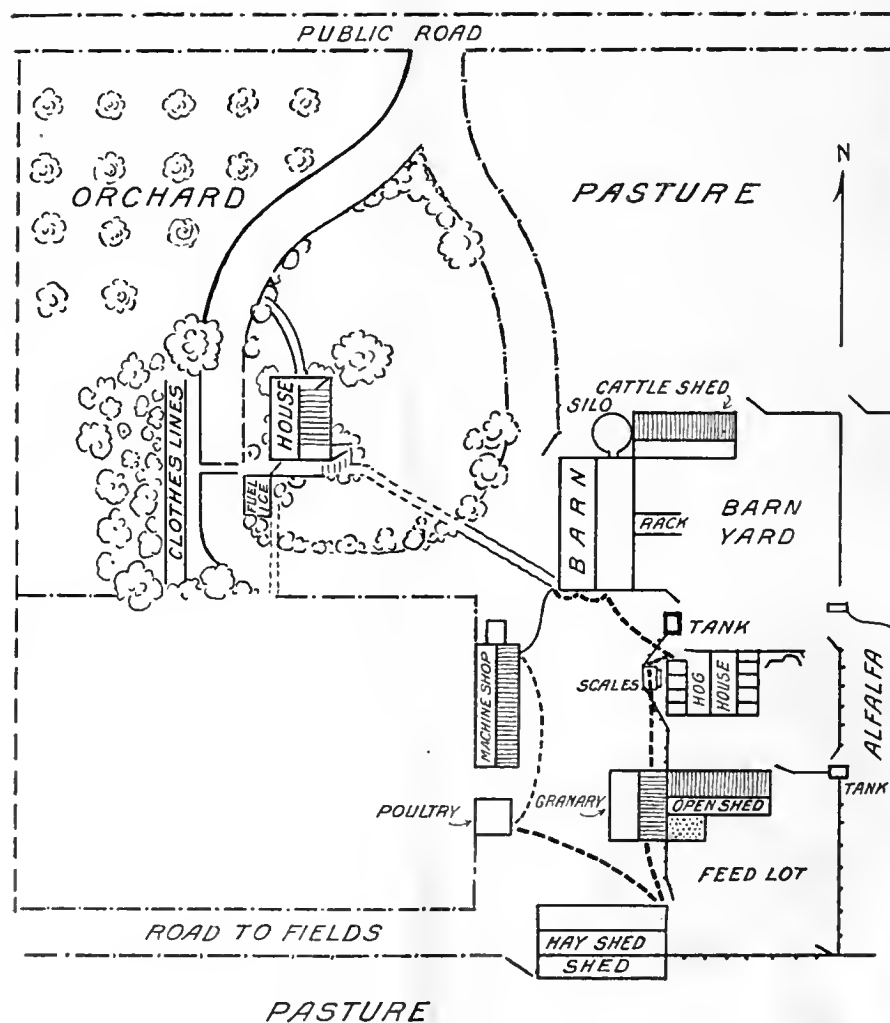
Factory managers save thousands of dollars each year by devising methods of saving labor, but very little study has been giving to the arrangement of farm buildings so that farm operations can be made efficient. Yet one-fifth of the value of all farm properties is invested in buildings. Actual observation has shown that proper arrangement of farm buildings in many instances saves 1 mile of walking every day, or 365 miles per year. In 30 years this would mean over 10,000 miles.

### GENERAL RULES

Methods of farming and topographical and geographical locations may vary so much that it is impossible to furnish a standard plan that can be adopted on many farms. It is possible, however, to give an outline of laws governing good arrangement, together with a farmstead plan which approaches the ideal and furnishes suggestions which will aid in arranging each individual farmstead.

Some rules in arranging the farmstead follow:

1. It is possible to heat buildings artificially but not to cool them in that manner. Hence, take advantage of natural elements to make the buildings comfortable in summer as well as in winter.



2. Low, hemmed-in alleys are damp and hot in summer and very little, if any, warmer in winter than high and slightly places.

3. The land on which the buildings are located does not produce crops. For this reason, when choosing between two locations, choose the one which has the poorer soil.

4. A sandy soil washes slowly and drains well.

5. The winter winds are from the north and the summer breezes are from the south. Take advantage of this and let the buildings be windbreaks to the yards, but keep them open to the south. Odors will not reach the house if the barn and yards are placed toward the east.

6. Buildings situated in the sun but with breezes blowing through them in the summer are cooler and more comfortable than those in the shade with no breezes. Hence, a barn with a central alley running north and south is cool, even in very hot weather.

7. When buildings are protected from the north winds with trees or a hill, but are open to the south they are warmer in winter and cooler in summer than those which are closed to the south breezes and exposed to the north. A southeast hillside is a very desirable location.

8. A southeast slope is best; a south slope ranks second; southwest, third; east, fourth; and west, fifth. Northeast, north, and northwest slopes are to be avoided if possible. A level site, while poorly drained, is to be preferred to the last-named three. South slopes are good for feed yards.

9. Good fences always pay, and each barnyard fence should serve two lots if possible.

10. Select a good view for the house. Remember that the women spend most of their time there. A good view of the surrounding country does much to relieve monotony.

11. If buildings can be placed close to the highway such a location is to be preferred to others. However, the house should not be placed too close to a main automobile highway, as dust is very unpleasant.

12. Do not place too much stress on having the buildings close to the water supply, as it is generally cheaper to pump the water through pipes than to put in several extra hours daily on account of poorly located buildings. Tanks should be so situated as to serve two lots if possible.

13. An east front is most desirable for a house, south next, west third, and north last.

14. Do not have the barn traffic pass the house.

## A COOPERATIVE DAIRY ASSOCIATION

**J. W. TAYLOR**, president and manager of the Elephant Butte Irrigation District of New Mexico, Rio Grande project, furnishes the following interesting statement concerning the operations of the Cooperative Dairy Association on the project:

Cooperative selling of dairy products on the Rio Grande project started in 1916 as a small corporation financed by farmers and had a capital of \$2,500. This organization has grown rapidly until its present stage of development shows a capitalization of \$100,000. Until two years ago business was handled by a corporation the stock of which was subscribed voluntarily by the dairymen interested. At that time it was realized that it should be made more strictly cooperative, and the business was reorganized under the cooperative marketing law of the State of Texas. The old corporation was still maintained, the Cooperative delivering its milk under a cross contract to the corporation, guaranteeing to the latter all the costs of processing and selling milk and milk products, dividends on its stock amounting to 10 per cent. Any revenues above these costs and dividends are distributed to the dairymen and are taken care of for the most part in an estimated price paid monthly on the milk. This price at present is \$3.50 per hundred for 4 per cent milk, with 5 cents additional or deducted for every one-tenth of 1 per cent of butterfat that the milk varies from the 4 per cent test.

Any proceeds accumulated above the amount paid on the estimated value of milk to the shippers are distributed annually in a twenty-fifth milk check. Payments are made to shippers for milk twice a month. The corporation is financed by the members of the Cooperative who have pledged themselves to a deduction from their milk checks of 5 per cents of the amount due them in each payment. This 5 per cent, instead of being paid in cash, is paid in stock in the corporation, and in this manner the rapid expansion of the plant has been provided for.

There are at present 199 dairymen in this Cooperative. The plant in El Paso employs approximately 90 employees. It is the best equipped milk and ice-cream

plant in the Southwest, and is fully provided with facilities for both wholesale and retail delivery.

During 1924 the dairy farmers belonging to the association received 63 per cent of the amount paid by the consumer for milk during the year, the average for the United States showing that the producers get ordinarily but slightly more than 40 per cent. In addition to the return for milk, the stock which is owned practically entirely by dairymen, gives a substantial return in the 10 per cent dividends paid.

The association is now selling fluid milk and ice cream and cheese, and very shortly will be manufacturing and selling butter and condensed milk, if the development of dairying permits. The association handles slightly more than one-third of the milk consumed in El Paso, the daily capacity being about 3,500 gallons.

The association is controlled by a directorate of five, and the management works on a commission basis. A small paper that goes to our members is published semimonthly, and there is also a small paper published by the employees of the association which is distributed in the plant.

The price which the dairy farmers have received for their milk is the highest in this section of the United States, and the price which the consumer pays is below the average for the United States. The business of the association has increased steadily every year since 1916. The members of the association received during 1924 about 3 per cent more for their milk than did dairy farmers who shipped elsewhere. Last year's business amounted to something over \$500,000, and there is no question that this year's business will greatly exceed that amount.

Prospects are that the gross income from agricultural products in the United States for the crop year 1924-25 may reach approximately \$12,000,000,000, compared with \$11,500,000,000 in 1923-24 and \$9,550,000,000 in 1921-22.

Success in cooperation depends on finding men capable of running cooperative associations, on the loyal support of the membership, and on getting a sufficient volume of business.

15. Fence the poultry from house and garden.

16. Have the garden convenient to the kitchen door.

## COOPERATIVE MARKETING PRINCIPLES OUTLINED

Geo. C. Kreutzer, Director of Reclamation Economics, describes specific instances which illustrates the principles of cooperative marketing tending to success

**D**URING the war the hog raisers of the San Joaquin Valley were at the mercy of local buyers and were producing animals of inferior quality and receiving little or no profits. Since California did not have a stockyard system of marketing, these buyers would go out through the country and buy from individual farmers small lots of hogs, make up a carload lot, and then sell them to the packers, making a profit on their various deals. Since these men were speculators, it was to be expected that they would buy as cheaply as possible. Farmers were not producing high quality stuff because the buyers were continually trying to justify their purchase prices by telling the farmer that his hogs were either too large or too small or some other excuse was given to justify the low price offered. It appeared to me that here was an opportunity for a successful cooperative enterprise and that it would accomplish two things: First, to sell the hogs at their true market value, and, secondly, by carefully grading, to encourage the farmer to produce superior quality.

The matter was taken up at community meetings and committees appointed in order that all would thoroughly understand what was needed and what had to be accomplished. The plan was to have the farmers bring their stock to the nearest shipping point and there grade them into carload lots based on quality. We then invited the packers to send their buyers and we would sell these carloads by auction to the highest bidder. Thus prime smooth hogs weighing 175 pounds were classed as A-1 and other cars were made of lesser quality until finally the rough stuff was put into the last car. We found that the packers were anxious to buy the prime stuff and pay a premium for it. The farmer who, through ignorance or carelessness, put in poor stuff found that with only a little effort on his part he could produce A-1 quality and receive therefor the premium price. As time went along and the sales became more numerous the general quality of the hogs throughout the whole valley began to improve and likewise the profits and industry increased.

We organized this as a department of the Farm Bureau and the county agent took a good deal of interest in the activity. We needed very little equipment to do this because the stock pens along the railroad were the places of business. Scales had already been provided, hence the commission of 1 per cent was suffi-

cient to not only operate the institutions but to bring money into the treasury of the Farm Bureau. I am told by the present manager of this institution that they have sold about \$4,000,000 worth of stock and have about \$5,000 or \$6,000 in the bank. They have a sale somewhere every day except Sunday and Monday. The fine thing about this institution was that there was no necessity of creating a debt nor of asking the farmers for a contribution other than putting their stock into the sale.

We also organized a successful cooperative dairy association which marketed the produce of all of the dairies on the Durham State Land Settlement. We based this undertaking on superior quality and service. We started out by borrowing a No. 17 De Laval separator and our output was only \$40 a week. The farmers cooperating took turns turning the handle of this machine, and the cream was sold as sweet cream at 9 cents above the San Francisco quotation, but we were insistent on having quality, and our produce was sold to an ice-cream factory and does about \$200,000 worth of business a year. A fraction of the selling price of the products was taken into the treasury of the association each month to pay for equipment and to pay operating expenses; thus as the business grew the equipment

was increased without creating a debt which ordinarily must bear interest. The Durham Cooperative Dairyman's Association assesses their members only \$3 per cow when they enter the association, and all future improvements are taken out of the selling price of the products.

I do not believe in farmers going extensively into debt in these cooperative associations, because the interest on the debt amounts to more than they could produce under the old system of marketing, and, again, the financial burden often falls on the shoulders of the few loyal ones.

In all of these enterprises, of course, management is the important factor. The Durham Dairymen's Association would have gone on the rocks several times if it had not been rescued by those interested in saving it and who had good business sense.

It is my belief that a successful cooperative enterprise can only be established where you are producing superior quality of products to which shall be attached a superior service and finally where the expenses of selling and managing shall be kept at a minimum. I also believe that any money required to capitalize these enterprises should be largely put up by those receiving the benefits. Any other system is unsound and will sooner or later get into trouble.

I do not believe it is possible to organize a cooperative institution that will handle all kinds of products. Community organizations are the only ones that have succeeded. The point is, I do not think an organization could handle milk, potatoes, grain, poultry, and livestock without getting into trouble. The handling of each of these products is a skilled business; therefore, for any project I believe we should pick out the commodity that needs organization and start with the ones that are the most easy to handle and that need this character of service. However, it will take the undivided attention and interest of some good honest man who has business sense to put any one of them across.

The national farm power survey by the Department of Agriculture shows that the present consumption of electricity on the farms of the United States is considerably less than the power load required in pumping for irrigation and drainage.

### COOPERATION

*"L. M. Lawson, superintendent of the Rio Grande project, recently requested a conference with farmers to consider ways and means of improving the present system of distributing irrigation water from the Bureau of Reclamation canals and laterals. This shows a fine spirit of cooperation on the part of our project superintendent. Mr. Lawson has directed reclamation work on our irrigation system for many years and has his heart in this great achievement to an extent that few of us realize. That Mr. Lawson is vitally interested in perfecting every detail of his project before it is finally turned over to the water users is shown by this conference with farmers. This conference is also a strong testimonial from one of the biggest men in the Rio Grande Valley to the fine spirit of cooperation now existing among all organizations in this project."*—Rio Grande Farmer.

## SOUTH AFRICAN IRRIGATION ENCOUNTERS DIFFICULTIES

*The settlers are meeting conditions in many respects identical with those on the irrigation projects of the Bureau of Reclamation, necessitating changes in the laws covering repayments*

THE Midland News and Karoo Farmer, published at Cradock, Cape Province, South Africa, contained recently a series of articles on the development of irrigation in South Africa, covering in general the history of irrigation in that Province, calling attention to the agricultural depression following the World War, and concluding with the statement that the "new era is full of promise, that petty recriminations must be a thing of the past, and that settlers must be aided in their early efforts." The following brief extracts, indicating that human nature is much the same the world over, will be of interest to students of irrigation problems in the United States:

"That irrigation has not yet proved itself to be the success that was anticipated can not be denied. Did it prove an immediate success in other countries? For many years it was a dream; now it has passed from a dream to a reality, but it has forged a new link in the chain of progress. It is not difficult for an unprejudiced mind to admit the reasonableness of the claim that no Government could have done more to aid the growing desire for irrigation development, supported as it has been by a loyal and hard-working staff of engineers. The new era which is dawning, and which was so well outlined by the honorable the Minister for Lands at the Irrigation Congress in Johannesburg, for the settlement of lands already under irrigation and the cessation of the program of large construction until such time as this has been done, is full of promise.

"Mistakes have been made in the past, no one is free from blame entirely, but the mistakes have been honestly made both by the Government, engineers, farmers, and settlers. Proof has been furnished with painful frequency that the areas held by individual owners are too large for development by them with the limited means at their disposal. The long-cherished hope of speculation in land at the expense of the State has departed; with it we see a great cry going up to the Government to help, which has not been in vain. It is to be hoped, now that the Government has stated its intentions, the individual will be able to concentrate on the development of such limited area as he can personally supervise and that the State will take over the balance of the land at its true value and assist to settle it. The mere constructing of irrigation works does not increase the true value of land; it does, however, increase its possibilities.

"It has been deplorable to note how for some time past there has been a growing tendency to blame the Government and their officials for the failure to do what now may appear obvious but has only become so in the light of experience.

"Can anyone deny that the many local and parochial differences of opinion between those who have been entrusted with the carrying out of cooperation schemes with State funds, to say nothing of the petty recriminations among the users of water, have retarded the progress of land settlement under irrigation schemes and driven away many of those whom it is most desirable to see settled in the fertile valleys of the Midlands and Eastern Province? Read what the liquidators of an important irrigation settlement say in their report:

"One thing is certain, that unless settlers and others cease harping upon the past and realize that recriminations do not improve the general prospects of those interested, but instead devote themselves to making a success of their various undertakings, the ultimate success of the irrigation scheme and the prosperity of the settlement will only be delayed thereby, and the people who will derive the benefits may not be the present holders, but their successors."

"In conclusion, the following remarks by Dr. Elwood Mead, than whom no one has a greater right to speak with authority, may be of interest:

"It is too much to expect the average settler unaided to bridge the gap between raw land and farm that will support him; financial or engineering aid, sometimes both, are needed.

"As carried out by the Government or ordinary private enterprise, even our most complete irrigation projects do not clear the land, level it off into suitable checks, and throw up borders; laterals and boxes are not put in, nor are the best methods of irrigation determined and laid out. But all these detailed improvements, which have to be made before the first crop can be seeded, are quite as essential to the success of the new settler and are often

more costly than the canals and reservoirs themselves.

"It is, therefore, most unwise to leave all this work, which is not farming, but rather engineering, for the inexperienced settler. In his hands it is likely to cost twice what it would, and at a time when there is no income from the land the necessity for any considerable outlay may spell failure for the individual. It is men with small capital who are most often attracted to the irrigation projects, and these are the men we must continue to attract by making the farming of such land a venture within the reach of limited capital."

As indicating the lessons which South Africa has learned and how they agree with the recommendations of the Committee of Special Advisers on Reclamation for the irrigation projects under the Bureau of Reclamation, the following from a recent letter from Mr. A. D. Lewis, Director of Irrigation of South Africa, is of especial interest:

"Our irrigation works are very expensive, as we have very little permanent water and have to rely on storage dams to catch irregular floods. An approximate figure of cost would be about \$100 per acre. The cost has to be repaid over varying periods, usually between 20 and 60 years, with an average of about 40.

"At first two free years were allowed after completion of the works and then a full uniform rate became due. Two years ago we altered the act and allowed four years of reduced payments following the two free years, and now we are contemplating altering the four to eight.

"The land is nearly always in private ownership and usually in areas much bigger than the owners can work. In some cases a single owner holds as much as 4,000 acres. This has been the cause of all our troubles and we are endeavoring to remedy them."

Apparently these two great sister nations have reached much the same conclusions concerning the future success of irrigation development and the modifications of the law which alone will make this success possible.

### OREGON APPOINTEE ON SECRETARY'S BOARD

W. A. Delzell, of Salem, Oreg., has been designated by the governor of Oregon and appointed by the Secretary of the Interior to serve on the Board of Survey and Adjustments.

The notable record already made by the American farmer in the profitable use of labor-saving equipment of all types would seem to warrant the next step of making larger and more diversified use of the most convenient and flexible form of power, electricity.

## RECREATIONAL UNITS ON PROJECTS

**T**HE Joint Committee on Recreational Survey of Federal Lands, cooperating with the President's Committee on Outdoor Recreation, has undertaken to gather information to aid the President's committee in formulating a national policy on outdoor recreation.

In furtherance of this plan, a survey is being made of the recreational possibilities on Federal lands and waters as a basis for developing Federal policies of land use, in which outdoor recreation will have its proper place.

The first step in this survey was the preparation of a questionnaire, copies of which have been sent to each project

superintendent with a view to eliciting definite information concerning recreational units on the projects.

Virtually all the projects have responded with complete information concerning their recreational possibilities, and these replies have been supplemented in the Washington office with photographs of the various reservoirs and other recreational units and with descriptive articles which have appeared from time to time in the *NEW RECLAMATION ERA*.

The recreational possibilities of many places on the projects, from the standpoints of fishing, camping, boating, scenic attraction, etc., have been well

recognized for many years. This survey affords an excellent opportunity to correlate these possibilities and, through the printed report, which doubtless will appear later, to bring them prominently to the attention of the public generally.

Reports concerning recreational units on the projects have so far been received as follows:

*Orland project, California.*—East Park Reservoir.

*Uncompahgre project, Colorado.*—Grand Canyon of the Gunnison; Picture Rocks; Ouray Memorial Park.

*Boise project, Idaho.*—Arrowrock Reservoir; Deer Flat Reservoir; Black Canyon Reservoir.

*Minidoka project, Idaho.*—Lake Walcott; Jackson Lake.

*Huntley project, Montana.*—Pompeys Pillar Rock.

*Milk River project, Montana.*—Nelson Reservoir.

*Sun River project, Montana.*—Sun River Canyon.

*Lower Yellowstone project, Montana-North Dakota.*—Joes Island.

*North Platte project, Nebraska-Wyoming.*—Pathfinder Reservoir; Lake Minatare; Guernsey reservoir.

*Newlands project, Nevada.*—Lahontan Reservoir; Lake Tahoe; Pyramid Lake.

*Carlsbad project, New Mexico.*—McMillan Reservoir; Avalon Reservoir; Carlsbad Cavern.

*Rio Grande project, New Mexico-Texas.*—Elephant Butte Reservoir.

*Umatilla project, Oregon.*—Cold Springs Reservoir.

*Klamath project, Oregon-California.*—Clear Lake Reservoir; Lava beds.

*Belle Fourche project, South Dakota.*—Belle Fourche Reservoir.

*Strawberry Valley project, Utah.*—Strawberry Reservoir.

*Okanogan project, Washington.*—Conconully Reservoir.

*Yakima project, Washington.*—Tieton Reservoir; Bumping Lake; Lake Cle Elum; Lake Kachess; Lake Keechelus; Clear Creek Reservoir.

*Riverton project, Wyoming.*—Pilot Butte Reservoir.

*Shoshone project, Wyoming.*—Shoshone Canyon.

## FREE RECLAMATION

EDITORIAL FROM THE RENO GAZETTE

**I**F Nevada expects a continuance of Federal reclamation, and she certainly does, she will not be led astray by specious arguments that the cost of construction, which is now repaid by her settlers, should be borne by the Government upon the theory of national benefits received.

The State has just been visited by the Secretary of the Interior and the Commissioner of Reclamation, both of whom have been requested to give their active support to the prosecution of the Federal projects already authorized or under way. Next month the Reclamation Committee of the House and a special reclamation commission headed by Thomas E. Campbell and Prof. John A. Widtsoe will come to the State to view the Newlands project and the proposed Spanish Springs unit. The two parties will be composed of men who are convinced that Federal reclamation must be placed upon a sound business basis and not treated as a pork-barrel enterprise, and the advancement of the latter theory can be productive of nothing but harm to Nevada.

The fact is that neither Nevada nor any other State can consistently ask for the free reclamation of its lands. And if any such plan were adopted by the Government, it would practically end Federal reclamation in Nevada, for the excellent reason that in many other States, particularly in the South, there are millions of acres of cut-over and swamp lands that can be reclaimed far cheaper than those of the Rockies.

The Gazette would repeat again that the present reclamation law and the fund which it provides restrict reclamation to the Far West, which maintains the reclamation fund through the sale of its public lands and its oil royalties. Once the principle of repayments is abandoned the fund will almost wholly disappear and any fund created from Treasury appropriations would become available to all the States. In the scramble that would ensue, and with the relatively cheap projects that could be brought forward by other and more powerful States, Nevada's opportunities for recognition would be small indeed.

The principle of repaying construction costs is sound. By its application the settlers become the absolute owners of their engineering works, water rights, and lands. They are not held in the permanent position of Government wards, nor of persons living upon the bounty of the public.

Nevada is not requesting something for nothing. She is not soliciting gifts. She proposes her reclamation projects as sound business enterprises that will fully repay their costs. She is not asking that the Government venture upon a scheme of paternalism that is contrary to all of its recognized and established principles.

Good, sound growth in the cooperative movement has been somewhat retarded in recent years by overenthusiastic persons who have held it up as a panacea for all the ills from which the farmers are suffering. The mere organization of a cooperative association is not the end to be attained. It is only the beginning.



## GUERNSEY DAM CONTRACT AWARDED

A CONTRACT for the construction of the Guernsey Dam on the North Platte reclamation project in Nebraska and Wyoming was awarded May 4 to the Utah Construction Co., Salt Lake City, by the Interior Department.

The company's bid to build the dam was \$1,288,121, which is within the engineering estimate of the Bureau of Reclamation. Bids for the building of the dam were opened on March 10, 1925, at Mitchell, Nebr. The Utah Construction Co. was the only bidder for the contract.

The act of December 5, 1924 (Public, No. 292, 68th Cong.), contains the following appropriation:

North Platte irrigation project, Nebraska and Wyoming: For continued investigations, commencement of construction of the Guernsey Reservoir and incidental operations, \$800,000.

The act contains the following proviso:

*Provided, That no part of the sums herein appropriated shall be used for the commencement of construction work on any reclamation project which has not been recommended by the Commissioner of Reclamation and the Secretary of the Interior and approved by the President as to its agricultural and engineering feasibility and the reasonableness of its estimated construction cost.*

Both the President and the Secretary of the Interior have approved of the Guernsey Reservoir and power plant in accordance with these terms of the law.

The estimated cost of the dam, in round numbers, is \$1,780,000. The estimated cost of a 2,500-kilowatt power development at the dam is \$325,000. To the foregoing must be added (a) \$121,000, most of which has been already expended in connection with surveys and investigations, the purchase of flooded lands, and road construction, and (b) \$290,000 needed in connection with a subsidiary power plant at Lingle, Nebr., and transmission lines connected therewith. The total estimated cost of the dam and power development therefore aggregates \$2,516,000.

To recoup this expenditure the Government may look to the following sources: (a) the Interstate division of the North Platte project. The landowners on this division have agreed in the manner provided by the act of Congress of August 13, 1914 (38 Stat. 686), to an increase of the construction charge against their land of \$16 an acre, a part of which it is provided may be utilized for the building of the Guernsey reservoir, including a 2,500-

kilowatt power development. From this source it is estimated that a return of \$966,000 will be available for the Guernsey reservoir and power development; (b) the Northport division of the North Platte project, from which, under contract with the United States, a total of \$134,000 is to be paid for the Guernsey reservoir and power development; and (c) the Fort Laramie division of the North Platte project, on which construction charges have not yet been announced, but these charges when announced will include a rate per acre which, in addition to other amounts, will produce a return of \$885,000 applicable to the cost of the Guernsey reservoir and power development. These figures aggregate \$1,985,000.

The above amounts are to be returned from the North Platte project which has been under development for a number of years. From existing knowledge of the agricultural conditions on the project, it is believed that the water users on the Interstate, Northport, and Fort Laramie divisions will be able to pay, within the period allowed by the reclamation law, their construction charges, including items in the amounts stated above, for the Guernsey Dam and power development.

It will be noted that the anticipated returns from the Interstate, Northport,

and Fort Laramie divisions of the North Platte project fall short by approximately half a million dollars of producing sufficient returns to repay the entire estimated cost of the development. The remainder, however, will be obtained from the net revenue which will be derived from the sale of power which has been and will be developed at the Guernsey reservoir. The act of March 3, 1925 (Public No. 580, 68th Cong.), provides: "That all net revenues from any power plant connected with the Guernsey Dam shall be applied to the repayment of the construction costs incurred by the Government on the project, until the obligations are fully paid." The contracts already made and pending insure a net return of about \$40,000 per annum, which will pay off the remainder of the construction cost of approximately \$500,000, in less than fifteen years. There is also a possible increase in revenue from the sale of additional water for irrigation, as the reservoir will have a capacity considerably in excess of the requirements of the areas hitherto named, which will contribute to the repayment of these costs, and the sale of this surplus water to other lands would expedite the payment of construction costs.

The bureau has investigated, in a preliminary way, several prospective projects in Wyoming and Nebraska to which the surplus water in the reservoir could be sold, but the investigations have not been carried to a point where positive forecasts can be made regarding such sales. This, however, is not necessary.



Lined section of Cross Cut Canal, Salt River project, Ariz.

## SOME HELPFUL IRRIGATION RULES

1. KEEP the ditches in order. A sluggish current increases the water loss.
2. Line the ditches with concrete, or lay cement pipe lines. This settles the problem of seepage loss permanently and almost eliminates ditch maintenance.
3. Grade the land surface evenly. High places become "slick," low places invite watergrass, sun scald, and puddling of the soil. The "lands" should be level crosswise, but with adequate fall lengthwise.
4. Plow deeply. Deep-plowed soil utilizes all of the rainfall, takes the irrigation water more readily, forms a mulch quickly and permits better aeration.
5. Use short lands for light soils. The best length depends mainly upon the character of the soil, but also on the slope and on the head of water available.
6. Divide a large head of water into "unit heads" of such size as to give uniformity of irrigation throughout the length of furrow or land. If the upper ends of lands get too much water, divide the head into fewer lands or order a larger head; if the upper ends get too little, irrigate more lands at the same time. Larger unit heads are needed on lighter soils, flatter slopes, or longer lands or furrows.
7. Test the soil the day after irrigating to determine the depth of water penetration. Use a soil auger, a pointed rod, or a shovel. Ascertain if the water penetra-

tion is about right and whether it is uniform from end to end of lands or furrows.

8. Irrigate before planting. Have the soil well stored with water to a depth of 4 or 5 feet. Then allow a good root development before the next irrigation.

9. Do not overirrigate. An excess of water is an injury. Many crops do not require heavy irrigations. Even alfalfa can be given too much at a time.

10. Do not hesitate to irrigate at night. The big projects run water continuously. Why should not a pump irrigator also? The evaporation loss is much less at night. Pumping plants should be operated night and day through the hot growing months.

11. Irrigate at the most favorable time. Irrigate alfalfa when two-thirds grown, but not just after cutting; grains when just out of boot; and corn when in tassel and silk.

12. Examine the soil occasionally. Bore or dig into it at least 3 feet. Does it pack nicely in the hand? Irrigate when soil and crop indicate the need of water and not according to calendar. There should be always some reserve moisture in the soil to prevent wilting and to assure a profitable yield.

13. Cultivate. A loose soil mulch prevents baking and cracking of the soil and permits aeration of the roots. Cracks permit heavy losses by evaporation. Use

an alfalfa renovator in August, in late fall, and in spring if alfalfa has been pastured. Row crops need cultivation after each irrigation, though in cases of cotton, corn, and milo cultivation is not possible in the latter part of the season.

14. Fight the weeds; eradicate them. Weeds rob the crop of water, sunshine, and plant food.

15. Rotate the crops; keep the soil fertile. Use alfalfa in the rotation; grow legumes and plow them under; all crop residues, straw, and stalks should be plowed under.

16. Do not irrigate the roads. Your neighbors do not appreciate this. Keep the gophers out of the ditch banks, shut off the water in time, and the highways will not become bogs.

17. Measure the water. Set a weir on your supply ditch. Are you getting as much water as you pay for? Do you know how much each crop is using? You measure everything else; why not the water supply?—*Bulletin 101, Arizona Agricultural Experiment Station.*

## STATE COOPERATION IN RECLAMATION WORK

Last December Congress authorized the appropriation of \$100,000 for investigations to determine how arid and semi-arid, swamp, and cut-over lands may best be developed. The language of the authorization limits the investigation to the development of these lands, but no area is truly developed until it is settled and put to human use; and the problem of how to select the settlers and how to help them become established in permanent homes is more important than a study of how to dig ditches or pull stumps.

The States of North and South Carolina have carried on investigations and made able reports on rural conditions and on settlement problems. The interest taken by these State governments and by their agricultural colleges indicates that here is a friendly and fruitful field for the use of a part of this appropriation.

The investigation, if undertaken, should deal with neglected lands, where settlement can begin with the least preliminary outlay, where money and effort can be saved for the improvement of the farms and financing the settlers. There should be gardens and comfortable houses for farm workers who have no capital, and money to help complete the development of farms when settlers have from \$1,500 to \$3,000 of their own. The chief satisfaction the country can give is a mode of life superior to that of the city, and the basis of that to the wage worker and farmer must be ownership of his home.

WASHINGTON: GOVERNMENT PRINTING OFFICE: 1925



Excellent potatoes are grown on the Shoshone project, Wyo.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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					Name	Office
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Huntley.....	Ballantine, Mont.....	A. R. McGinness.....	J. P. Siebeteicher.....	Miss M. C. Simek.....	E. E. Roddis.....	Billings, Mont.
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Milk River.....	Malta, Mont.....	G. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
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Salt River <sup>2</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>3</sup> .....				
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
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Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	G. O. Patterson.....	C. M. Voyer.....	H. L. Holgate.....	Portland, Oreg.
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Williston.....	Williston, N. Dak.....	W. S. Arthur.....	W. S. Arthur.....	H. C. Melaas.....	E. E. Roddis.....	Billings, Mont.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho.....	F. A. Banks <sup>4</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo.....	F. F. Smith <sup>5</sup> .....	Chas. Klingman.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>6</sup> .....	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.

<sup>1</sup> Attorney.

<sup>2</sup> Project operated by Salt River Valley Water Users' Association

<sup>3</sup> General Superintendent and Chief Engineer.

<sup>4</sup> Construction Engineer.

<sup>5</sup> Superintendent in charge.

<sup>6</sup> Superintendent of Construction.

The NEW RECLAMATION ERA is issued every month by the Bureau of Reclamation of the Department of the Interior, Washington, D. C. It is printed by the Government Printing Office, Washington, D. C.

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*TO MANY the importance of aid and direction to settlers is not realized. Many look on the idea that it is a public question as nonsense, that Federal aid is paternalism, but these views arise out of the fact that we have not recognized the revolutionary change in conditions wrought in this country by the disappearance of free fertile land. For more than a century this free land had been the beacon of hope to the industrious and enterprising. It had caused the Nation to look on a settlement as a frontier problem, which was being solved by crowding the Indian farther west and making free farms out of his domain. This was a solution only so long as we had great natural wealth at our disposal. This is now gone, and we must provide something to take its place. The need for this is not imaginary. We are faced with a rural exodus which in the last census showed a declining farm population in most States, and will show a great increase in that decline in the next.*

# NEW RECLAMATION ERA

VOL. 16

JULY, 1925

NO. 7



SHOSHONE DAM AND RESERVOIR, SHOSHONE PROJECT, WYOMING



*“WE are committed to a development of all feasible reclamation projects. That is the policy of the Administration. It must be remembered, however, that no new project is feasible unless it can be settled and that no old project from which the settlers are leaving and to which new farmers can not be attracted will ultimately survive.*

*“The Reclamation Service can build irrigation works, but it can not draft settlers. We hope States, railroads, and chambers of commerce will cooperate with us to this end. Local towns and States will be the first beneficiaries from new projects, the Government will be the last. The first intention of reclamation was to build homes. We want to insure the ownership of these homes to those who make them.”*

*HUBERT WORK,  
Secretary of the Interior.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

JULY, 1925

No. 7

## PROBLEMS THAT MUST BE MET IN FUTURE RECLAMATION

*Since the purpose of the act was to create home-owning farmers, our first care should be their welfare. The human element involved in reclamation should be our first concern*

*By the Secretary of the Interior*

CONGRESS made appropriations last winter for new reclamation projects which will cost when completed between \$50,000,000 and \$60,000,000. Other projects authorized by earlier Congresses and partly completed will bring the total construction cost of new works to \$110,000,000. Together these different structures will provide water for more than 400,000 acres of land, or about 10,000 farms. The construction costs will be much higher than on the older projects, the estimates ranging from \$100 to \$160 an acre. Expenses for farm development will also be higher than before the World War.

The States and communities where these projects are being built or contemplated are exceedingly interested in this construction. Rarely a day passes that an appeal for early action does not come to the Interior Department. The department is being pressed to investigate and undertake additional projects in many new localities. The necessity for this development is fully realized, and I am anxious to bring about the accomplishment of these ends if it is feasible to do so.

But there is another side to reclamation. Conditions on some of the older projects convince me that before development goes much farther the plain facts experience has developed should be discussed on the ground with those interested, that we may have the same information.

There are projects from which come continued protests against being called upon to pay either construction costs or operating expenses.

Before I became secretary a cost review board had dealt with these protests against payment of charges. There have been moratoriums and postponements of payments dating back more than 10 years. It would seem, therefore, that before we begin on this new program of construction where the average cost will be nearly double that of the older projects we ought

to determine what is wrong and if possible travel in a new direction.

If the fault is inherent in irrigated agriculture, then reclamation construction should cease until the profits of agriculture improve. If it is due to bad management or defects in our past policy, then we should understand what those errors were

### SECRETARY TO MAKE TRIP TO PROJECTS

*Secretary Work and Commissioner Mead are making another trip to a number of the projects, including Shoshone, Sun River, Yakima, Kittitas, Tieton Dam, Baker, Vale, King Hill, and American Falls Dam. They left Washington about the middle of June and expect to return about July 17.*

*Writing to the project superintendents and district counsel concerning the trip, Commissioner Mead pointed out that "the most serious feature that confronts the bureau is the failure of water users to meet their payments, especially operation and maintenance costs."*

*"It is realized that the hard times encountered by farmers everywhere during the last three or four years are largely responsible for this situation, but the Reclamation Bureau is a service and not a credit agency. There is a growing feeling in Congress that works should not be operated where current operating expenses can not be met, and serious criticism of the bureau for accepting payments from one settler who makes great personal sacrifice to fulfill his obligation to the Government and permits other settlers who may be in a better position to evade the obligation by the simple expedient of not paying."*

and change them before we go farther with this new construction program.

On older projects there has been one fundamental mistake in the past. When payments were not made, instead of facing the situation and undertaking to ascertain the real situation and deal with it in the open a weak and temporizing expedient of deferring payments by giving blanket relief to all water users on a project was adopted. Under these moratoriums delinquent payments on operation were added to operating expenses. These blanket moratoriums gave no permanent relief to the struggling settler who had made his payments. They often did give relief to the well-to-do landowner able to make his payments by enabling him to escape.

Blanket relief does not give the tenant any better chance. He has to pay just as much rent as before. It does save the landlord from paying. Blanket relief is urged by bankers and business men because if the Government is not paid then their chances of receiving interest, having loans paid off, or having store accounts reduced are all improved. We have been discouraging blanket moratoriums. Whatever relief is given should be individual and based on the necessities of the individual. Where land is cultivated by tenants, it must be the inability of the landlord to pay that we should consider only.

Moratoriums do not offer relief from the burden of private debts on which settlers are paying a rate of interest which agriculture can not stand. They afford no relief to the mortgage foreclosures which menace many farmers. The Reclamation Bureau should not be called upon to operate and maintain canals without payments for the service rendered.

Within six months on one old project there were 206 farm foreclosures; on another a single individual recently foreclosed on 18 farms. On another one bank

(Continued on page 98)

## FEASIBILITY OF PROJECTS DEPENDS ON MANY FACTORS

*Proposed projects to be studied to discover what must be done to clear and level the land; whether the soil is good enough to warrant irrigation; what crops can be grown; and the nature of the local markets*

(Continued from page 97)

has taken trust deed titles to practically every farm in a small district.

The development of new projects need not, however, await the solution of the financial and tenancy problems of the old ones. The two are separate from each other.

The situation on the old projects is discussed only because we must not make mistakes in building new ones and create the same unwholesome conditions. New projects must be brought quickly under cultivation and the inadequate capital of settlers be supplemented by advances from a fund where the interest rate will be lower and the time of repayment longer than a commercial bank or any ordinary credit agency can give. The repayment of that money must be insured through the reclamation authorities. They and they alone are in a position to know what ought to be done, to watch how the settler uses his time, to help him increase his income, or to dispose of his holdings to some one better fitted to succeed.

All Government irrigation projects should be organized into districts. The people living thereon should manage and operate them. They would then decide all these local questions themselves, including recommendations for deferring payments due the Government.

I shall study these proposed projects to discover what will have to be done to clear and level the land; whether the soil is good enough to warrant irrigation; what crops can be grown and the nature of the local markets. These are all essential factors in determining the productive value of water in irrigation and the returns which settlers can obtain for their labor. With this information we will be in a better position to determine what promises we can make settlers and what methods can be adopted to attract and hold people on these areas. These factors must all be weighed before the Secretary of the Interior can say to Congress whether or not a proposed project is feasible.

On some new projects the land is all or nearly all owned by the Government. On others, practically all is privately owned. With the exception of one project, the land is unimproved and unpeopled.

How to work out a coordinated plan for the settlement of privately owned lands held in excess of a homestead unit is not clear to me. There is an objection to the Government buying this land. Landowners object to assuming any definite obligation to pay charges imposed by the

Government or to fixing, in advance, a price for their land. We have been negotiating for months with owners of large areas to find out what they are willing to sell for. The price that settlers have to pay for this privately owned land is as fundamental as the construction cost of the water right. But it is evident that we are to encounter a selfish attitude on the part of some owners. Landowners who have done nothing to the land and never intend to farm it themselves are asking \$50 an acre, when in its present condition it can not possibly earn interest on \$5 an acre. They wish to profit by the Government's investment in canals—a profit the settler can not afford to pay. This is plain talk, but the time has come for a common understanding between the Reclamation Service, the farmers, and Congress. Responsibility for the success of Federal reclamation lies first with the people in project towns and States; second, the Reclamation Service; and, finally, with Congress. If Federal reclamation is to be regarded as a source for obtaining Government money to be spent locally, instead of first aid to settling a permanent community, it will fail, as it already has in some instances. The Department of the Interior stands between the new farming communities and Congress. Without help from the farmer we can not interest the latter. The farm pest on many projects has not been grasshoppers or cutworms, but men who have been farming the farmers, often dividing them, and for fees arraying them against each other. Repudiation has actually been urged and farmers advised that if payments were delayed the Government would eventually tire of trying to collect and charge it off, all of which tended to convince eastern Congressmen that Federal irrigation had failed in the West.

We are concerned about the high percentage of tenancy on these projects and are anxious to know what steps can be taken to reduce it. Why is it that so many settlers are behind in their payments; and what, if anything, should be done about the refunding of their debts to others than the Government?

Some months ago I stated to the President my conviction that a new program in reclamation was necessary and that it should include—

1. Cooperation between the Federal Government and the States where projects are located.

2. Advances to settlers to help complete the improvement and equipment of their

farms—a low interest to be charged on these advances.

3. That where projects include land in private ownership held in excess of homestead units development should not begin until an agreement has been reached with these owners fixing the price of that land to settlers and methods of colonization.

We have built canals on more generous terms than any other country. Nowhere else are they built without any charge for interest, but two-thirds of the land under the canals already built was privately owned when the works were authorized, and the benefits of our generous construction terms went mainly to profit landowners.

Since the purpose of the act was to create home-owning farmers, our first care should be their welfare. Heretofore the Reclamation Bureau has made construction the central idea, acting on the theory that building irrigation works would create irrigated agriculture. It has done this after a fashion, but it is too largely a tenant agriculture. If the future program is based on the idea that the settler is to be selected; that he is to have enough capital to underwrite any advances that the Government makes; if the advance is to be used to improve land that the Government owns; and if the whole development is to be watched and safeguarded by Government supervision, it should tend to cure the unbusinesslike policy of the past. It seems to be simply a common-sense businesslike program. It gives aid and direction where it is most needed. Anyway there appears to be no sound argument why we should not give some new method a trial, and that was all that was proposed in the legislation recommended last winter and which had the approval of the Bureau of the Budget.

It was thought we should try out at Willwood on the Shoshone project the settlement program recommended by the committee that studied conditions there and that we should do the same thing on two others of these new developing projects where it is believed that settlers can not be obtained without this help.

That conservative program was criticized from two angles. One was that it did not go far enough and the other that it ought not to go at all. A substitute proposal was made that the State should attend to settlement. This view was adopted by the Appropriations Committee of Congress, and in three of the

appropriations for new projects it is required that the State where the project is located shall contract with the Secretary of the Interior, the State agreeing to subdivide and settle the lands and advance money needed to complete the development of farms.

Although State cooperation and State advancements are regarded as desirable and will I hope be a part of future development, it is realized that some States which seriously need irrigation development can not furnish the money which the settlement program will require. They could cooperate with the Government in this, and I hope that legislation providing for cooperation and requiring States to assume part of the financial risk and responsibility for every new project undertaken within their borders will be passed by the next Congress. I am convinced that Government aid in construction of irrigation works is fundamentally sound in theory, although its policy has failed in results. Irrigated farms will be needed to take the place of depleted timber and mineral resources and particularly to substitute for a declining range stock industry. If irrigation works are to be built on a large scale, the Government must assist in it, but we must bear in mind that the cost of construction and farm labor has doubled in 10 years and that the price of farm produce has not; that the demands for new farm opportunities are not as pressing as they were 20 years ago.

Reclamation projects will not be built by private enterprises, because there is no margin of profit in such undertakings. Unpaid irrigation bonds, worthless irrigation stock, and financial failure of many large private irrigation developments warn against this. The fact that it does not pay directly is no evidence that it has not great potential value to the Government, but this value is in futurity and we must plan accordingly. We do not maintain schools or build roads for their direct money return. The reclamation works have brought large indirect returns. That is why the English, Italian, Australian and other Governments are spending hundreds of millions of dollars on irrigation works to extend agriculture in their arid lands, and that is why this country should continue Federal reclamation.

Overproduction of farm products is urged as against more irrigation projects. It will require 10 years to complete the projects, old and new, already authorized by Congress. No new projects should be undertaken until this has been accomplished and we have established an enduring policy.

This Nation has another problem outside of production and increasing our wealth in land. Powerful forces

have been in operation during the last quarter of a century to bring about a decay in the quality of our rural life. Farm life does not attract and hold, as it once did, the kind of people needed to safeguard democracy. We, through the States, must change this, and we must do it by creating interests and attractions native to the open country. In other words, we must begin to organize rural life as cities are organized and citizens must help, if they hope to buy food at prices they can afford to pay. There is no place which holds out such possibilities as one of these new reclamation projects where the interests, the experience, the altruism of our ablest minds can and should be enlisted in working out the development program of the institutions under which the people will live and work. The gains to this Nation in building up a rural life, where the people were tied to the land through ownership, where there was a civic pride in their farms, their homes, their local organizations, and where they

were bound to the Government by ties of affection and gratitude for what it had done for them can not be measured in dollars.

Reclamation of arid lands is only an incident to the agricultural problem of this Nation as a whole. It is the loss of the soil's fertility in every farming State that alarms me, for there is a direct relation between fertility of the soil and fertility of the mind. Irrigation is intended to popularize farm life; that those grown there may be rooted to the soil; that the farm shall be the ideal home unit and may continue to be the base supply for young men who may later become the Nation's advisers. This is of first importance to the United States and the greatest anxiety of the Department of the Interior that it may do its share toward it.

It is our purpose to build reclamation from the ground up—from the farmer to the Government, rather than from the Government to the dam and the dam to the desert.

The Reclamation Bureau is not now being conducted in the interests of individuals but for the best interests of those who live on the land and whom we hope may eventually own it. It is the human element involved in reclamation that should be our first concern—to protect the interests of those already on the land and prepare for those we shall invite to come.

The closer a farmer is to his market, both in actual distance and actual contact, the better off he is.

### NEULANDS PROJECT INCREASES PAYMENTS

*For the last four years, 1921 to 1924, collections on the Newlands project during the month of April averaged \$12,781. During the same month this year a total of \$28,981.12 was collected. Collections from May 1 to 15 amounted to \$6,958, compared with an average of \$7,887 for the entire month of May during the last four years.*



Evidences of prosperity on the Huntley project, Mont.

## RECLAMATION POLICY BASED ON ECONOMIC PRINCIPLES

*In the light of more economic knowledge, divergent policies may be merged, coordinated, and modified with a view to the adoption of a sane reclamation policy which is economically sound*

*By Prof. David Weeks, University of California*

**R**ECLAMATION of arid, swamp, flood, and cut-over lands has been a subject of many controversies in Congress, in State legislatures, and in numerous other official and nonofficial bodies. At present there are three reclamation policies in existence, each of which represents the point of view of a fairly large class of American people.

One of the policies may be stated briefly: "Reclaim no more land"; another—"Reclaim land, create financial machinery and reclaim more land"; while the third group insists that reclamation development should be governed solely by supply and demand.

Senator McNary, of Oregon, chairman of the Senate Committee on Irrigation and Reclamation, will introduce in the next session of Congress a bill "to encourage the development of the agricultural resources of the United States through Federal and State cooperation." Under this measure any district in any State would be able to secure temporary financial aid from the Federal Government for reclamation, provided State laws contain provisions whereby bonds may be issued by the district as a first lien on all the lands within its boundaries. The feasibility of the project would be determined by the Secretary of the Interior subject to review by Congress.

Feasibility is the keynote of the proposed legislation, and upon this word hinges the success or failure of the Senator's bill. Feasibility has within its five syllables all that engineering, agricultural, and economic investigations can determine, and then some.

Feasibility is dependent upon physical factors, such as soil, drainage, water supply, and workmanship of construction.

Feasibility depends upon climatic factors, such as rainfall, length of growing season, and range of temperature.

Feasibility most of all depends upon economic factors, and upon economic principles rests the future not only of each individual project but the successful administration of the whole plan. The first cost of raw land is not as important as the cost of its agricultural development. Costs of construction, costs of preparing land for irrigation and cultivation, costs of building houses and barns, costs of buying livestock, costs of buying equipment, and costs of planting and bringing crops into production form one important group of economic questions to

which we have not given proper consideration in the past, but which must be considered in the determination of feasibility.

Marketing and transportation facilities, crop adaptation, costs of production, and gross returns—not only cost of production and gross returns to-day but for the years to come—must be estimated in the determination of feasibility. Costs of production and gross returns over a long period of time are a complex study and are closely related to the operation of the law of supply and demand. If this were a simple law of nature, it could be examined by experimental processes. The whole study is, however, complicated by paucity of information, by human emotions, fickleness, changing desires, and prejudices. One of its most disturbing features is its slowness of operation.

When prices are high, there is a tendency for a smaller quantity of a product to be consumed and for greater quantities to be produced. Periods of high prices are periods of agricultural expansion. When prices are low, the opposite tends to be the result. Tendencies, however, are often upset for a time by disturbing influences. A low price of dairy products will often result in many farmers adding to their herds in order to bring their income up to its former level. After a time one dairyman after another will change from dairying to some other type of farming or will discontinue farming entirely. On the other hand, many farmers will hesitate for a time to build new dairy barns to take advantage of a rise in price. The response gradually takes place, however, and there is an increase in supply. This is only one type of instance illustrating the prevalence of influences which disturb the operation of the law of supply and demand. Numerous other instances could be given of this retarded response of supply to price change.

These irregularities are much more pronounced in regions where agricultural production is largely on reclaimed lands, as it is in the West. As a rule in reclaimed areas, agriculture is more intensive. Crops are more permanent in character. A period of high prices which indicates an increased demand is followed in the first instance by an expansion of the area under irrigation. Many new projects are organized during this period, but the construction is spread over a period of four or five years. Perhaps by the time water is available, prices have gone down,

but the lands within the irrigation projects must be developed or be confiscated by the overhead charges brought about by the new construction.

As a result thousands of acres of trees, vines, and alfalfa are planted which by the end of 3 or 4 years come into full bearing. Alfalfa, of course, does not take so long, but it does take time for the new farmer under irrigation to purchase necessary equipment and livestock. Thus about 9 or 10 years after development has been started by the demand impulse of maximum prices only part of the lands have been brought under full production. Much of this development is carried on during years of depression in the face of negative public sentiment in regard to agricultural expansion. A large part of the lands, due to high costs of development in proportion to current prices, wait for another cycle of high prices to be brought under cultivation. This retarded development has resulted in financial distress of thousands of farmers and failure of many irrigation enterprises.

Because of these complex irregularities a plan might be suggested which is a modification of the attitude toward letting development drift along in a rather haphazard fashion in response to supply and demand. Such a plan would contemplate a careful study of the operations of this and other economic laws with a view to meeting crises before they occur.

In California we are endeavoring by the investigation of actual rural conditions to develop a practical method of economic analysis of agriculture and agricultural lands under irrigation. There is much yet that we do not know, but one by one we are eliminating the uncertain factors upon which feasibility depends. In the light of more economic knowledge, divergent policies could be merged and coordinated with a modification of the one placing sole dependence upon supply and demand. This should bring about a sane reclamation policy which is economically sound.

The training of professional men equipped with understanding of these difficult problems, the education of the public, especially those directly concerned in agriculture and reclamation development concerning the purpose and need of special knowledge of this kind, will do much to prevent unwise and ill-timed development and yet permit a wholesome expansion of our agricultural resources.



## SAVE IRRIGATION WATER AND GROW MORE CROPS

*The problem of securing sufficient water for the production of the apple crop on the Okanogan project is the most serious problem now facing the growers.—One solution is more economical use of water*

*By Victor Morgan, in the Omok Chronicle*

**W**HERE a locality is subject to ever-recurring water shortage, the very best use of such water as is available should be the concern of all who irrigate. In order to make an economical use of irrigation water, certain fundamental facts must be understood.

Water applied to land will disappear in one of the following manners: (1) Used by plants, (2) run-off, (3) evaporation, (4) percolation. The use of water by plants is desirable. In this way food is made available and wilting prevented. If any of the other three occur, water is going to be lost, and consequently they should be prevented as much as possible. Run-off is never much of a problem, and evaporation can be controlled fairly well by cultivation. There is, however, always more or less of a loss of irrigation water by percolation or seepage. This will occur as soon as a soil reaches the limit of its water-holding capacity, and as soon as that point is reached no more water should be applied, as it will do no good, and not only does it do no good but it invariably does some harm. In some sections the continued heavy applications of water on upper benches have resulted in large areas of alkali land on the lower levels. Also the loss of plant food by leaching of the soil is quite an item. When any considerable amount of water passes downward through the soil, there will be a rather large percentage of soluble plant foods such as nitrates carried down with it.

The economical use of water practically means the prevention of percolation. To do this the person irrigating will have to know three things: (1) What is the water-holding capacity of the soil and in what length of time is that capacity reached after water is applied? (2) What is the least amount of moisture in the soil that the trees will stand without injury and how soon will that point be reached after irrigation? (3) How fast does the water spread sideways from a furrow?

The first of these three is important because, as has already been pointed out, when the limit of the soil's water-holding capacity has been reached percolation will take place and the water will be lost. Most soils have a fairly definite water-holding capacity, depending upon the size of the soil particles. Very fine clay will hold the most moisture and sandy soil will hold the least. After many

moisture tests I have found that the orchard soils of this region will hold about 13 to 15 per cent of moisture, by weight. Some of the land that has been in cover crop for a number of years and contains considerable humus will hold about 17 to 18 per cent of moisture. These figures represent the water-holding capacity.

### CONCLUSIONS BASED UPON EXPERIMENTS

1. That shorter irrigations are essential to the economical use of water.
2. That 12 hours is as long as it is necessary to run water. Any longer will result in waste.
3. In case of necessity 8 hours of irrigation will do.
4. That shorter furrows and more of them must be used.
5. That the 14-day period commonly used is too short early in the season and too long in the hottest part of the season.

It is also necessary to know about how dry the soil can get without injuring the trees. I have taken samples of soil surrounding trees upon which the apples were beginning to get a little soft and found that the moisture content ranged from  $2\frac{1}{2}$  to 4 per cent, depending somewhat upon the kind of day. Ordinarily the soil can get as low as 5 or 6 per cent and no harm result. It is desirable to approach this per cent as closely as possible before irrigation is begun, as the following explanation will show.

The actual quantities of water that the soil will take for any irrigation will lie somewhere between the water-holding capacity of, say, 16 per cent and the per cent of moisture which the soil contains when irrigation is begun. If the soil contains from 12 to 15 per cent of moisture when irrigation is started, as sometimes happens at the first or last irrigations of the season, obviously about 4 per cent of moisture is all that can be added, and as soon as the available pore space (pore space is the open space between soil grains not actually occupied by soil grains) in the soil is used up the remaining water has to find some place else to

go. It is very important that it be clearly understood that the soil will only hold a certain quantity and that that quantity is not very large if the soil is wet when irrigation is started. If the orchard soils in this region were underlain by a heavy clay as are soils in some sections, instead of gravel, the water would be found standing on top, following many irrigations. The following computation will illustrate this point:

For example, when irrigation is begun the soil contains 12 per cent of water and 16 per cent is its water-holding capacity; then 4 per cent is all that can be added. On the other hand, if the moisture content gets as low as 6 per cent, 11 per cent can be added, or about three times as much. Not every farmer will want to make moisture tests, but this point is emphasized because of the fact that if there is little room for water in the soil when irrigation is begun some waste of water will certainly occur.

So far it has been explained why it is well to know the water-holding capacity and the wilting point of the soil. The third factor of importance is the rate of lateral capillarity. This can be determined fairly well by the use of a shovel. It is not necessary to wet the soil to a distance of more than 18 inches below the level, as there is very little good soil and nothing much that the tree wants in the way of plant food below that level. Most of the available plant food will be found in the top 8 inches of soil where the remains of countless plants that have lived and died have been added to the soil and have become one of the chief sources of plant food. Many will argue that there are roots down as far as 3 and 4 feet and that therefore they should have water. There is hardly any doubt but that the water was put there first by overirrigation and that, naturally enough, the roots followed. Also in cases where the soil is gravelly water at that distance will not rise to the top, as water can not rise by capillarity in gravel.

The person irrigating should know how fast the water spreads outward from the furrow in order to know how close to place his furrows and not as a guide to the length of his irrigation. The proper length of irrigation should be determined in other ways, as has already been shown, and the distance between furrows adjusted accordingly. In eight hours water

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## DEVELOPMENT OF WYOMING'S IRRIGATION RESOURCES

*Without aid in farm development none of the projects built under war prices is feasible. Settlers with money enough of their own to change this raw land into farms will not come*

*By the Commissioner, Bureau of Reclamation*

**T**HE greatest economic problem of Wyoming is how to secure the complete development of the State's irrigation resources. Future population and wealth depend on this being made an agricultural State. Mines will be worked out, forests cut off, but the irrigated farm will endure. The kind of people who live on these farms and the kind of agriculture they follow will determine the character of the State's civilization and its material prosperity. As a part of that development the Federal Reclamation Bureau is building three projects in this State. In addition, investigations are being made of three additional projects. When they will be built will depend quite largely on the results of settlement and agricultural development on the older works.

### RIVERTON PROJECT

The Riverton project has an irrigable area of 100,000 acres, 69,000 acres of which is public land and 30,000 acres in private ownership. The irrigation works will cost \$8,350,000. Water rights for the first-class land will cost about \$100 an acre. Before the first unit is available for settlement the Government will have invested \$2,800,000. When the works are all completed, 1,500 farms will be needed to settle and cultivate the land as

### SAVE IRRIGATION WATER

(Continued from page 101)

will spread 2 feet each way from a furrow and therefore seven furrows are not any too many for a 30-foot tree row.

The economical use of water consists in getting the water onto the land in a short period of time. If an 8-hour period has been used, only one-third as much water will have been applied as in a 24-hour period.

I have made dozens of moisture tests on land irrigated 8, 12, 24, and 48 hours and have never found that the moisture content of the land irrigated the longer periods was consistently any greater than that irrigated the shorter periods. The soil may look wetter at the end of a long irrigation, but that is simply because the water can not run through the soil as fast as it is put on top. As soon as seepage can take place and the excess water has time to disappear (about 24 hours) the soil irrigated 24 or 48 hours will be found to contain no more moisture than that irrigated 8 or 12 hours.

irrigation requires, and this land will produce crops having an annual value of approximately \$2,000,000. Before this can be done settlers must be secured, and these settlers will have to begin with land unfenced, unleveled, covered with sagebrush, with everything needed to make it fit for human habitation remaining to be done. The improvement and equipment of these 80-acre farms will cost from \$5,000 to \$8,000 a farm, and the total capital required to change the raw land into farms will be somewhere between \$6,000,000 and \$9,000,000. If settlement is to be unaided, as it has been in the past, this development will be slow and the returns to the Government disappointing. The successful settlement and development of the land is therefore the most serious problem connected with this project.

### SHOSHONE PROJECT

The Shoshone project is intended to utilize the water of the Shoshone River. The estimated cost of the irrigation works is \$23,536,000. Water can be delivered to 216,000 acres of land, making the average cost of a water right more than \$100 an acre. The project is divided into five divisions, two of which, Garland and Frannie, have been settled. The undeveloped portion comprises an area of 144,000 acres lying in three divisions as follows: Willwood with 15,600 acres, Hart Mountain with 38,800, and Oregon Basin with 90,000 acres. Approximately all of the undeveloped area is in Government ownership and will require 1,800 settlers, who must be drawn mainly from outside the State.

### WILLWOOD DIVISION

The canals and laterals on the Willwood division are sufficiently advanced to insure water for half that area during 1926 and for complete irrigation during the following season. The investment of the Reclamation Bureau in reservoirs and canals will be about \$100 an acre. Full settlement of this division will require 200 families and necessitate an investment in the clearing and leveling of land, improving and equipping farms of \$1,000,000 to \$1,500,000. The estimated annual crop return if these farms are fully improved is \$400,000.

Judging by past experiences it is believed that with careful selection of settlers now provided by law, but with no special

provision for financing or otherwise aiding farmers, not more than 50 per cent of the land would be settled in the first five years after public notice.

### HART MOUNTAIN DIVISION

The irrigable area of the Hart Mountain division is estimated at 38,800 acres. The total cost is estimated roughly at \$4,850,000, or approximately \$125 an acre. Settlers for this division must be secured from older agricultural districts, and this settlement will be facilitated or retarded in proportion to the arrangements made for giving aid and direction in agricultural development. To cultivate properly the 38,800 acres of irrigable land in this unit will require approximately 500 farmers. If this development is to take place promptly, these 500 farmers must expend from \$2,000,000 to \$3,000,000 in improving and equipping their farms during the first five years. For reasons to be stated hereafter it is believed that a considerable portion of this money must be provided by private or governmental organizations. The settler will not bring it to the project.

### OREGON BASIN DIVISION

The Oregon Basin division when completed will constitute the largest single unit of the Shoshone project. It has 90,000 acres of irrigable land and will cost approximately \$9,630,000, or about \$110 an acre. The capital required for the expeditious development of the farms on this area would be between \$6,000,000 and \$10,000,000. Without organized financial backing for settlers by which money would be provided at a low rate of interest and on long terms of repayment, the successful development of this area would undoubtedly be delayed many years, with a consequent economic loss to the State and the Nation. With this area fully developed and farms properly improved, the annual crop values should be between \$1,500,000 and \$2,500,000.

The area in all three of the undeveloped divisions is mainly Government land, not susceptible of agriculture without irrigation because of the limited rainfall. Appropriations have not been requested of Congress for the construction of the two last-named divisions, and no definite date can be set when work will be commenced. What will be done will depend largely on the success of agriculture and settlers' repayments under the divisions of the

project already settled or ready for settlement.

On these two projects the State of Wyoming has an area of 30,000 acres of desert land lying under works practically completed and more than 200,000 additional acres for which works have been partly constructed. To settle and properly develop these two projects will require the labor of 3,000 families and an investment of \$15,000,000 to \$25,000,000 of new capital for the improvement and equipment of farms alone.

The annual production, if the land is cultivated as irrigation requires, will approximate \$6,000,000, and the increase in value of the State's resources will exceed \$50,000,000. The engineering features of this great development present no insurmountable obstacles. It is the social and economic problems which remain to be solved. Construction should therefore be deferred until a program has been adopted under which settlers can be secured and given a real opportunity.

#### **NO AUTHORITY FOR AIDED AND DIRECTED SETTLEMENT**

If we open these lands to settlement under the present reclamation law, we will have no authority to advance money to help improve and equip farms, nor to clear and level the land, build houses or fences, in advance of settlement. The reclamation law was greatly improved in certain particulars by the last Congress, but it does not provide help for settlers in the difficult and unremunerative work of changing raw land into cultivated fields.

It was the unanimous opinion of five boards which last summer considered the settlement conditions on new projects that unless conditions for settlers are made more attractive than they are under the existing law settlement and agricultural development will be so slow as to discredit every new development. Although they did not agree fully as to what should be done to attract settlers and promote development, they all recommended radical changes from anything that is possible under the law in its present form.

#### **PROPOSED SETTLEMENT PLAN FOR WILLWOOD**

A report on conditions at Willwood and a settlement plan were prepared last year by George C. Kreutzer, who has had experience both in Australia and America, Andrew Weiss, for many years in charge of the North Platte project, and L. H. Mitchell, now in charge of the Shoshone project. All these men have for years had a personal familiarity with conditions in Wyoming.

The committee recommended that settlers be carefully selected in accordance

with their experience, capital, and other desirable and necessary characteristics, the selection of the settlers to be made by a board composed in part of citizens of Wyoming.

That provision be made for homes for farm laborers in tracts of approximately 5 acres each, grouped at convenient locations where employment is most likely to be had.

That a competent irrigation adviser should be provided by the Bureau of Reclamation whose duties would include:

(a) Preparing and seeding crops on unsold land.

(b) Corresponding with and assisting in obtaining suitable settlers.

(c) Assisting settlers in making selection of farms to meet their needs; in locating suitable cows, horses, and other livestock; in their building plans, farmstead layouts, tools, and equipment; and in working out financial and agricultural programs.

(d) Helping them form cooperative associations and in transferring their holdings, in case of failure, to new settlers.

That a fund of \$500,000 be provided to be used in making advances to settlers to assist in completing the development of their farms and equipping them with livestock and tools. Such advances should not exceed 60 per cent of the value of such improvements or livestock and should be secured by a first lien, the settlers to provide the 40 per cent. The advances should bear 4 per cent interest and be advanced for 3 years to not exceeding 20 years; repayments to be amortized half yearly.

That a set of 10 suitable house plans, several barn plans, and several typical farmstead layout plans be provided.

That means be provided to secure stock and domestic water for each farm (well water at Willwood is unfit for use), the cost of providing such stock and domestic water supply to be added to the construction cost.

That the Chicago, Burlington & Quincy Railroad and the Great Western Sugar Co. be apprised of the fact that a spur line is needed to open this area to beet growing.

That land speculation be prevented by suitable laws and regulations. No farm should be sold, sublet, or assigned without the permission of this bureau, all arrears to the Government to be paid before the sale is approved. If profit is made in such transactions, at least one-half the profit derived by the vendor should be applied to the construction charges.

If all these things are done, the settlers will still have to work hard, live on plain food, wear patched clothes, and have

many hardships and disappointments. But if these things are provided, if the State and Federal Government work with the settlers, we may expect a large percentage of those who make the attempt to develop and buy farms will succeed.

#### **FEDERAL OR STATE AID TO SETTLERS NECESSARY**

This committee believes that if the things it recommends are provided qualified settlers will be attracted and that the money advanced and the construction costs of canals will be paid. Such a settlement program can not be carried out unless the State or the Bureau of Reclamation is given authority and money to act. Senator Kendrick and Congressman Winter, of Wyoming, attempted to secure legislation last winter. They introduced bills which would enable the bureau to help in farm development and required the settler to have not less than \$1,500 capital and farm experience. Provision was made for a farm adviser who would be at the settler's elbow to help bring about teamwork between settlers in getting material needed for their improvements at wholesale prices through community orders and to work out cultivation and marketing programs. Advances up to \$3,000 for a farm were provided, the settler to put up \$40 against each \$60 advanced from the reclamation fund. The settler's own money would in this way underwrite the advance, and as the land belonged to the United States the Government would be doubly secured, since the improvement would increase the value of its land.

It seems to be a sound, common-sense, businesslike plan, but it was opposed by those who did not realize how hard it will be to secure settlers on projects where water rights will cost from \$100 to \$150 an acre and by those who object to taking money out of the reclamation fund to help develop farms, believing this fund should be kept entirely for construction. I believe a better understanding of what has happened on old projects will change this. We had better spend a little more money and make one project a success than build two failures. If this measure is not to be adopted, then we must have some other.

Another plan considered by Congress is to make settlement and farm development a State matter. On three projects this year's appropriations are conditional on the States entering into contracts with the Interior Department under which the State will subdivide the land, find the settlers, and advance money needed to improve farms. Under this plan we would have to advance not less than \$1,000,000 for farm development of land about ready for settlement at Willwood and Riverton.

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## WYOMING'S IRRIGATION RESOURCES

(Continued from page 103)

Without aid in farm development none of the projects built under war prices is feasible. Settlers with money enough of their own to change this raw land into farms will not come.

That is not all; leaving settlement and agriculture to shape themselves was a mistake that has cost the reclamation fund millions of dollars and will cost more. It has created financial conditions on older projects that can be cured only by refunding settlers' private debts or getting a new body of settlers. This is not conjecture; it is a fact. On the Garland and Frannie divisions of the Shoshone project settlers were accepted without any inquiry into their fitness and were given neither advice nor aid. What is the result? They have undergone a crucifixion; about 200 farms have been abandoned. Many have lost their homes through foreclosure. Payments are not made to the Government. Settlers are in arrears on construction payments \$336,000, and on operation costs \$251,000. Out of 70,000 acres in these two divisions only 38,000 are irrigated. Of the 838 farms now being cultivated 412, or nearly half, are cultivated by tenants.

Similar conditions exist on the North Platte project, which is partly in Wyoming and partly in Nebraska. The ultimate cost is estimated to be \$19,626,000, of which \$16,650,000 has already been spent. The project includes the Pathfinder Reservoir and the Interstate, Northport, and Fort Laramie divisions. Repayment comes from sales of stored water under the Warren Act and from payments made by settlers under the three divisions.

Here, as at Shoshone, farm development has been slow. More than 60,000 acres for which water has been provided are still uncultivated. Here also tenancy destroys the desirable social purposes of the act. Of 2,019 farms on the project 1,021 are cultivated by tenants and 998 by owners or managers. We have a condition of tenancy worse than in the older sections of the country.

The financial results are equally disturbing. Out of \$3,042,000 construction charges due the Government \$1,276,000 are unpaid. Out of \$1,939,000 operation and maintenance costs \$473,000 remains unpaid. Water sold under Warren Act contracts should be paid for like coal or any other commodity, but out of \$627,000 due on these contracts \$175,000 is unpaid. When settlers are pressed to pay, they present statistics of private debts, of mortgage foreclosures, and others impending which render it evident that the

percentage of tenancy is certain to be increased if some refunding and settlement program is not adopted here.

### DIFFICULTIES OF THE SETTLERS NOT UNDERSTOOD

Those not familiar with the distressing conditions on the older projects say settle the new ones as the old ones were settled. They would not say this if they had gone through the grueling experiences of project superintendents.

They would not say it if they knew our anxieties over the condition of those settlers and the prospects of saving the Government's investment in works.

Nearly all this trouble has its origin in accepting unfit settlers and leaving the good ones to struggle unaided against obstacles too great for them to overcome. In May I wrote to the authorities of a district, not in Wyoming, where no payments on operation expenses are being made, to say that this could not continue. Their reply is that half the land is not cultivated at all, one-fifth cultivated by renters who are poor farmers, and that the cultivators living on their land are dead broke and in debt.

They say that the land is good, that the canals are well built, that valuable crops could be grown, but that under the kind of farming now practiced the average value of crops is less than \$15 an acre. The further statement is made that "The Government contributed in bringing to pass the present situation. It caused the project to get off on the wrong foot by

accepting too large a proportion of men who did not know farming and did not intend to become farmers. Business and professional men, clerks, school-teachers, and tradesmen in this vicinity at one time owned irrigated farms, so that in the collapse of values following the war the market could not absorb the offerings. In addition to this genteel class the project received a horde of discontented workers whose experience would fit them for anything but irrigation agriculture. The negligible repayments of the past few years can be traced to the kind of people placed on the land.

It would relieve the Bureau of Reclamation of an arduous and trying responsibility if the States would take charge of settlement and farm development. Whoever does it will have a difficult task because they will be in touch with people engaged in hard and trying work under new and strange conditions and helping them to keep up their courage and cut down expenses.

But we are faced by one of two alternatives. We should either assume this burden or quit building canals.

The main purpose of irrigation is to furnish the requisite amount of moisture to cropped soil.

A large concern of the farmer should be in lessening the waste of water in his supply ditch and on his farm.

One of the most common sources of loss of water in irrigation is poor preparation of the surface of the land being irrigated.



The South Canal on the Uncompahgre project, Colo



## RIO GRANDE EMBARGO LIFTED BY SECRETARY'S ORDER

*Based on fact that the purpose of the original withdrawals has been accomplished, that the Secretary has no power to suspend laws of Congress, and that granting of water rights is vested in the States*

**A**N embargo preventing the granting of rights for the use of public lands along the Rio Grande in New Mexico and Colorado for the storage and diversion of water, made in 1896 by the then Secretary of the Interior, was lifted on May 20, 1925, by order of the Secretary of the Interior.

The original purpose of the embargo was to prevent the building of dams, canals, and other irrigation works on Government lands along the river, pending settlement of water rights with Mexico and construction of the Rio Grande reclamation project.

A portion of the memorandum accompanying the order follows:

The matter of the embargo or refusal to approve applications for rights of way for reservoirs and canals on the Rio Grande was recently brought to issue by the application for the Vega Sylvester Reservoir, a proposed irrigation project in the State of Colorado. On thorough consideration of that application and a finding by the Bureau of Reclamation that its approval would not interfere with the rights of the United States or water users under or in connection with the Rio Grande reclamation project, approval of the right of way was given. Protests against this action have occasioned a thorough review of the entire situation, which is found to be as follows:

(1) The claims of the Republic of Mexico to the use of the waters of the Rio Grande for irrigation purposes have been ascertained, protected, and provided for by convention, by acts of Congress, and by the construction of the Elephant Butte Dam and Reservoir near Engle, N. Mex., with a storage capacity of more than 40 times the maximum amount of water to which Mexico is entitled under the treaty. In the absence of accident or such unusual condition as is provided for in article 2 of the treaty, there seems to be no physical possibility of the Mexican rights being affected in any way by any action hereafter taken. As above set out, conditions of unusual drought or arising from accident are provided for in article 2 of the treaty. Therefore the suspension of applications for rights of way over public lands of the United States or refusal to grant same because of Mexican claims is clearly no longer warranted or required.

(2) The Rio Grande reclamation project, consisting of an immense storage dam across the Rio Grande near Engle, N. Mex., with appurtenant canals or other necessary structures, has been built and

water has been and is being furnished in satisfaction of Mexican treaty rights; also for the irrigation of lands, under the reclamation act, in the State of New Mexico and the State of Texas. I am advised that water is now being furnished or is held available for all the lands in the original project. The water rights of the Rio Grande project acquired, as provided in section 8 of the reclamation act, by appropriation in conformity with the laws of the States and carried into beneficial use by the construction of the storage and diversion works and by the application of the water to lands for purposes of reclamation and irrigation, have been accomplished and the rights thus vested and secured. The continuance of the embargo or order of suspension against granting of rights of way across public lands on the upper Rio Grande is therefore not required for the protection of the Government reclamation project. In fact, the purpose of the said order of withdrawal has long since been accomplished.

(3) The Rio Grande within the limits of New Mexico (and Colorado) is not a navigable stream. Therefore, the granting of rights of way over public lands along the upper Rio Grande does not affect any navigable stream within the limits of the States of Colorado and New Mexico.

(4) As a matter of fact, the approval of right of way for the Vega Sylvester Reservoir or future approval of rights of way for other reservoirs or canals on the upper Rio Grande can in no way defeat or diminish the water rights of any appropriator of water from the Rio Grande or its tributaries. A grant under the act of March 3, 1891 (26 Stat. 1095), does not create, grant, or establish a water right. It merely authorizes a corporation, association, or individuals to build on the public land a dam, reservoir, canal, or ditch to store or transport water, the right to use which must be acquired under the laws of the State.

(5) Appropriations of water must be made under State laws, and the control of the flow and the use of water is vested in the several States. Relative rights of appropriators and water users are determinable only under the laws of the States. This has been the uniform ruling of the department for more than 17 years. Consequently the withdrawal order or embargo merely precluded citizens from using and occupying unappropriated pub-

lic lands for their dams, reservoirs, or canals, but did not and could not affect their legal rights to appropriate water under the laws of their States. As a matter of fact, during the period of the embargo a large number of applications have been so made and the water stored and used through structures constructed over privately owned lands.

(6) Under the laws of the States of Colorado and New Mexico the use of water is governed by the doctrine of appropriation, followed by putting the waters so appropriated to beneficial use. As between two appropriators, other things being equal, priority controls. This method of determination is not confined to State lines, but applies to all States through which the river flows. In other words, in the case of a stream like the Rio Grande, traversing two States, priority of appropriation, followed by beneficial use, gives priority over subsequent appropriators and water users in either State. See case of *Wyoming v. Colorado* (259 U. S. 419).

(7) While the claims of Mexico and the fact that those claims were receiving executive and legislative consideration in connection with the treaty later adopted and proclaimed may have warranted a suspension of the granting of rights of way through public lands at that time, I am satisfied, now that all questions directly or indirectly connected with that situation have been settled and protected, that there is no warrant at this time for the Secretary of the Interior to suspend or obstruct the operation of the law of Congress of March 3, 1891, in its operation over the unreserved public domain in the States of Colorado and New Mexico. That act specifically granted a right of way through the public land for structures for irrigation, and where all conditions of the act are met by an applicant leaves no discretion in the head of the department as to its operation. It is the duty of the executive officers to carry into effect and administer laws passed by Congress, and I know of no authority in the Secretary of the Interior to suspend or defeat the operation of any such law. Neither can I find any warrant for refusing citizens who have made appropriations in compliance with the laws of their States of waters therein the right to use or traverse unreserved public lands of the United States in utilizing waters so appropriated.

(8) It is urged that the withdrawal or embargo should be kept in force until

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## DRAINAGE AND WATER RENTAL CHARGES, BOISE PROJECT

*Letter to Superintendent Bond from the commissioner points out that the showings made for the necessity for extension in time of payment are entirely inadequate, and applications are accordingly rejected*

A FIRM stand against granting of indiscriminate blanket relief to settlers able to pay on Federal reclamation projects by the repeated deferment of charges due the Government has been taken by the Commissioner of Reclamation with the sanction of the Secretary of the Interior.

The commissioner's action resulted from applications by 392 water users of the Boise reclamation project in Idaho for extension of time covering water rental and drainage charges, which were presented after irrigation began and after relief from payment of irrigation charges amounting to more than \$1,000,000 had been granted. Not only were these applications for a postponement of charges denied on the ground that the showing of inability to pay was inadequate, but in a letter to the superintendent of the Boise project, the commissioner discussed the general situation applicable to all the Federal projects with regard to deferred payments. The letter follows:

There are certain important features relating to extension of time for payment of uncollected water right charges applicable to all projects. These I wish to discuss in passing upon the 229 applications received with your letters of May 22, 23, 26, and 27 relating to drainage and water rental charges against lands outside of the limits of the Nampa and Meridian irrigation district and 163 applications by owners of lands within the limit

of the district, received with your letters of May 27 and 29.

Under date of April 18 the Secretary of the Interior directed that water be delivered for 60 days from that date to give landowners an opportunity to apply for relief.

Prior to this the department had on April 3 authorized extension to the Nampa and Meridian district for the payment of drainage charges, payments to be made monthly at the rate of \$7,000 until the entire amount of \$40,050.54 plus interest has been liquidated; and substantially similar terms were tendered the water users outside of the district limits on April 6, payments to be made monthly so that the entire amount due would be absorbed by the end of the present irrigation season.

Applications received almost invariably request extension to March 1, 1927, and in many cases they cover water rental charges. It has never been the intention of this bureau to recommend or of the department to grant extension on drainage and rental charges for the length of time stated or at all as to the latter charges.

The applications cover small amounts, the majority of them being for sums aggregating less than \$100. This is not one year's payments but often covers charges for the years 1921, 1922, 1923, and a portion of 1924. In many cases no payments have been made since 1920. Some applications cover amounts as low as \$7.50,

which we are asked to distribute over a period of three years. Authority has been heretofore granted to extend these charges so that payment may be made in five monthly installments, which in the case of the application just mentioned would mean that payments of \$1.50 monthly would be required. In the majority of the cases the payments to be made would amount to not more than \$25 monthly.

The showings made of the necessity for extension are entirely inadequate. It is difficult to believe that the returns from irrigated agriculture in this section have been so small that it has been impossible for water users during the last three or four years to pay the charges mentioned or that they can not now pay them when given an opportunity for payment in monthly installments.

All applications are accordingly rejected, and you are directed to advise the water users that payments must be made either wholly on or before July 1, or in five monthly installments, the first of which must be paid on or before July 1 next. You are directed to withhold the delivery of water unless and until payments are made as here stated.

These applications for extensions were not presented until after the opening of the irrigation season, leaving little time for inspection and report, and I take it that this is the reason why they were forwarded without any comment from you regarding the agricultural status of each applicant. I am not unmindful of the large amount of work which a personal investigation and report by you would have involved, but in all future cases of this character it is highly desirable that every application be accompanied by a report based on a personal investigation of yourself or one of your assistants. You will at once realize it is difficult for this office to pass upon these applications solely upon the paper record presented, which in many cases is incomplete and unsatisfactory.

When relief was granted last year for extension in the payment of other charges aggregating approximately \$1,120,000, it was assumed that no further relief would be required or requested. The additional and belated demand for extension of drainage and water-rental charges therefore came as a great surprise.

I believe it not out of place in this connection to comment upon the general

## RIO GRANDE EMBARGO LIFTED

(Continued from page 103)

after the commissioners of the States of Colorado, New Mexico, and Texas have opportunity to consider the question of a compact relating to the waters of the Rio Grande and possibly reach a basis upon which the States named could agree upon a division of the waters. As already pointed out, the act of March 3, 1891, and grants made thereunder convey no water, but simply the right to occupy and use public lands, and the maintenance or revocation of the order of suspension of 1907 can have no real bearing upon the action of the commission or the settlement between the States involved of the water question, the latter being one wholly within their jurisdiction and to be determined irrespective of the right of way act of 1891 or

any action which the Interior Department may take in connection therewith.

It has been suggested that a hearing be held at which all who desire may appear and submit their views, but the facts are of record and could not be changed by argument. No legal rights of any nation, State, association, or individual to water appropriated and used under State law will be defeated or changed by the action proposed. There appears, therefore, no reason for subjecting anyone to the expense of attendance upon such a hearing.

Therefore, in view of the foregoing, it is believed that the so-called order of withdrawal or embargo should be revoked, effective immediately, and the laws of Congress and of the States permitted to operate.

situation with regard to payments. The relief act of May 9, 1924, and the so-called fact finders' law, approved December 5, 1924, are designed to give relief only in those cases where it is really needed. These acts are not designed to facilitate and encourage the evasion or postponement of legitimate charges the payment of which is within the financial ability of the water users. This fundamental fact unfortunately appears to have been ignored by many. The evidence is not wanting to support the conviction that many water users have refused to make payments in any case regardless of financial ability, believing that under the act of December 5, 1924, all back charges will be funded and a three-year moratorium will be granted in every case, even though not urgently needed, merely because the law affords authority for such action. They have therefore deliberately shaped their action to the end that there may be accumulated and remain outstanding when contract is made under the new law all charges possible, so that they may take advantage of the maximum benefit authorized by the law.

Whatever may be the causes for postponement of payments, it has created a situation on this and other projects that menaces the good repute of reclamation and its continuation as a governmental policy. A recent investigation of the Government projects in Idaho has caused an inspector to submit to this department the following statement showing the rapid and disturbing growth of indebtedness. Unless this can be checked, it is inevitable that Congress will be reluctant to pass appropriations for new projects or that the country will indorse such appropriations and projects. Hence it becomes a matter not only of individual duty but of State interest and pride to make considerable sacrifice, if necessary, to see that the contracts made with the Government for the repayment of costs on this project are regarded and stand upon the same basis as other contractual obligations.

These figures attest the trend. Further comment as to the need for calling a halt in this postponement of payments and cumulating indebtedness is unnecessary. It might be mentioned that until there is a better showing in the way of repayments than has been made since 1920 it will be difficult to justify the construction of new projects, whose failure will be foredoomed if the representations now made and the record of the old projects in Idaho are to be taken as a fair criterion, the more so because water charges on the new projects will greatly exceed those on the old ones.



A home in the orchard district of Yakima Valley, Washington

*Status of uncollected water-charges with percentage of uncollected accruals on March 31, 1924, on the Boise project*

CONSTRUCTION

Year	Accruals	Uncollected	Per cent
1917.....	\$190,496.33	\$4.96	-----
1918.....	283,838.04	4.96	-----
1919.....	206,203.32	142.83	0.7
1920.....	208,520.33	12,262.77	5.9
1921.....	410,271.07	80,439.57	19.6
1922.....	421,821.59	129,456.14	30.7
1923.....	668,158.31	507,505.11	75.9
1924.....	692,491.56	575,593.04	83.1
Total.....	3,081,800.55	1,305,409.38	42.4

OPERATION AND MAINTENANCE

1918.....	\$217,428.88	\$143.13	-----
1919.....	277,066.66	253.39	0.1
1920.....	370,115.60	29,696.93	8.1
1921.....	348,336.20	62,905.93	18.1
1922.....	283,284.89	80,025.16	28.2
1923.....	246,911.27	157,744.34	63.9
1924.....	161,468.16	130,752.82	80.2
Total.....	1,904,611.66	461,823.70	24.2

DRAINAGE

1921.....	\$133,595.12	\$5,469.26	4.1
1922.....	139,197.31	11,586.08	8.3
1923.....	138,641.43	83,692.52	60.4
1924.....	138,100.65	104,427.86	75.6
Total.....	549,534.31	205,175.72	37.3

SUMMARY

Total uncollected charges, construction.	\$1,305,409.38
Total uncollected charges, operation and maintenance.....	461,823.70
Total uncollected charges, drainage .....	205,175.72
Grand total uncollected.....	1,972,408.80

The statements made in this letter are to be construed as passing at this time

only upon the matter of postponement of drainage and water-rental charges. The statements made are not to be taken as indicating action which may be taken upon reports made or to be made by the board of survey and adjustments. These reports will be taken up and consideration given to them at a later date, when such action will be taken as the conditions shown seem to warrant.

This general explanation is made in the belief that it is necessary and in the hope that a different attitude may be engendered on the part of some water users who possibly have not considered fully the aspects here discussed.

The matters discussed in this letter being of general interest, you are directed, in addition to giving personal notice to each applicant, to give this letter to the press in order that those outside the area concerned may understand the relation that solvency in old projects bears to future development.

Construction of a canning factory has been commenced at Wilder, on the Boise project, Idaho. This factory will employ 100 persons during three months each year. The output this year is estimated at 50,000 cases of corn and 20,000 cases of tomatoes. Later it is probable that considerable fruit and berries will be canned, thus extending the working season and providing a market for small fruits.

## TUNNEL NO. 3 CONSTRUCTED ON NORTH PLATTE PROJECT

*Tunnel more than a mile long, begun June 28, 1923, and holed through April 8, 1924, to carry water from the Fort Laramie Canal to the Gering Valley, described by J. K. Rohrer, resident engineer*

A HIGH brule clay ridge between the Mitchell and Gering Valleys, ending abruptly at Scotts Bluff, made it necessary to construct a tunnel to carry water into the latter valley from the Fort Laramie Canal. Three tunnel sites were available, requiring a tunnel 3,300 feet long in the easterly site 4 miles west of Gering, a tunnel 5,800 feet long 8 miles south and 2 miles east of Mitchell, and a tunnel 6,500 feet long at the most westerly site 8 miles south and 1 mile east of Mitchell.

The canal was located to the most easterly site on the north side of the ridge and back to the south end of the most westerly site on the south side of the ridge. A comparison of the cost of the complete system, using the several sites, was made, and it seemed advisable to use the longer tunnel at a higher cost to avoid carrying the main canal through 8 miles of bad lands crossed by a number of dry ravines 30 to 60 feet deep.

Plans and specifications were prepared in the Denver office. The plan called for a horseshoe section tunnel 10 feet 3 inches high and 6,500 feet long lined with a 10-inch concrete lining and 336 feet of reinforced concrete-lined canal at the upper portal and 536 feet at the lower portal. The contractor was to furnish everything except cement and steel. Bids were opened at Mitchell, April 16, 1923. Four bids were received. The contract was awarded to R. S. Morrow & Son, Omaha, Nebr., the low bidder. The contract was signed on May 12, 1923, and on May 15 the superintendent for the contractor arrived and began the preliminary work.

The approaches to the tunnel are 40 feet deep in clay loam and had been previously excavated by Government drag lines. The tunnel at the north portal is in earth for 1,390 feet and at the south portal 1,100 feet. It was necessary to timber the tunnel throughout. In the earth section five-piece frames of 6 by 8 inch timbers with vertical posts, 6 by 6 inch longitudinal sills, and 6 by 8 inch cross sills were used.

### *Tunnel No. 3, North Platte project*

Item	Unit	Quantity	Cost to United States
<b>CONTRACTOR</b>			
Excavation type A.....	Linear feet.....	4,011	\$86,236.50
Excavation type B.....	.....do.....	2,490	64,740.00
Excavation and trimming for approaches and lining.....	Cubic yards.....	2,242	2,242.00
Permanent timbering.....	M feet b. m.....	447.062	23,247.22
Concrete in tunnel, portals, and transition.....	Cubic yards.....	7,888.38	108,465.22
Concrete canal lining.....	.....do.....	336.84	4,378.92
Placing reinforced steel.....	Pounds.....	23,370	584.25
Backfill.....	Cubic yards.....	257	257.00
<b>UNITED STATES</b>			290,151.11
Material.....	.....	.....	35,118.51
Engineering.....	.....	.....	10,500.00
General expense.....	.....	.....	16,800.00
Total United States cost.....	.....	.....	352,569.62

In brule clay seven-piece frames were used with sloping posts and no cross sills. The frames were spaced 4 feet center to center in earth and 8 feet in clay. The frames in earth were com-

pletely lagged with 3-inch lagging, and in the brule clay an average of halfway down to the spring line.

Work was begun on June 28, 1923, driving the bore from both ends with two shifts a day. The bore was excavated to full section to the level of the bottom at the sides. Excavation was made 4 feet ahead of the timber in the earth section and the frame set in place and lagged. The material was loaded into cars on the track by hand, hauled to the portal by mules and pulled up an incline, shelved on the open cut to the dump with a hoist. When brule clay was reached and blasting became necessary, a shovel loader driven by air from a compressor on top near the portal was used to load the cars. Work was discontinued at the south portal and three shifts a day worked at the north portal until the heading was driven 3,050 feet, when the machinery was installed at the south portal. The bore was holed through on April 8, 1924.

The drilling for the blasting was done with coal augers run by air-driven breast drills.

The breast in brule clay was excavated about 50 feet ahead of the timber.

Ventilation during driving was obtained by a 30-inch blower driven by a small electric motor exhausting the gas from near the breast through a 6-inch pipe line through either one of the test pits dug by the Government or one of the well holes drilled on the center line of the tunnel by the contractor for this purpose.



A. South portal heading of tunnel No. 3. B. Paving south portal outlet

At 800 feet from the north portal some water was encountered and there was a small amount all the way to 1,000 feet from the south portal. The total flow amounted to 20 gallons per minute. This water was pumped to the surface through a well hole and during concreting was used for the concrete. After the bore was holed through, work was begun trimming the floor for concreting. One side of the floor was excavated to subgrade and poured, the track shifted onto that side, and the other side excavated and poured. The floor was poured all the way through except a gap 800 feet long where the main supply of water came in. The water table was near the floor and it was thought the concreting of the floor might diminish the supply below what was needed for concreting the barrel. Wood forms were used in concreting the barrel. The forms were built in 12-foot sections. The ribs carrying lagging to the spring line were set in place and wired and braced to the tunnel timbers. The form was filled to the spring line, a section of lagging put in on each side and that filled. The lagging for the top or keyway was in 4-foot sections. The top was usually poured 24 hours after the sides. The surface was given a face on a radial line so as not to weaken the arch. Ninety-six feet of forms were set at one setting. The forms were removed five days after the top was poured. Two shifts a day concreted and one shift set forms. The concrete mixer was located in the bottom of a draw 40 feet deep at 1,400 feet from the north portal. The materials came from stock piles on the level ground near the draw by gravity to the mixer. The cement came down a chute from the cement house and the water came from storage tanks on the edge of the draw. The mixer discharged through a shaft into the tunnel directly into cars. The concrete was hauled through the tunnel with a Fordson tractor mounted on a locomotive traction frame and fitted with special gears to give the same speeds in either direction. In filling the forms the cars were run up an incline onto a platform on trucks inside the forms. The cars were dumped and the concrete shoveled in by hand.

The concrete in the canal lining in the approaches was mixed with a small mixer set on the top of the open cut, chuted into the bottom, and shoveled into place.

The tunnel was lighted with electricity. Power for light and for the motors on the hoist, air compressor, and blower was obtained from the Government high-tension line that passed directly over the tunnel.

The costs and quantities of the complete structure are given in the accompanying table.

## REPORT ON PROPOSED PROJECTS

**A**N interesting addition to the relatively meager literature on the subject has recently been made by the Department of the Interior through the publication of a report on the agricultural and economic feasibility of seven proposed irrigation projects in the States of Washington, Oregon, Nevada, Utah, and Wyoming.

The report was prepared under the direction of the Commissioner of the Bureau of Reclamation by men familiar with the economics of irrigated agriculture and irrigation engineering and was reviewed by a separate local committee for each project, composed of bankers, business men, and farmers.

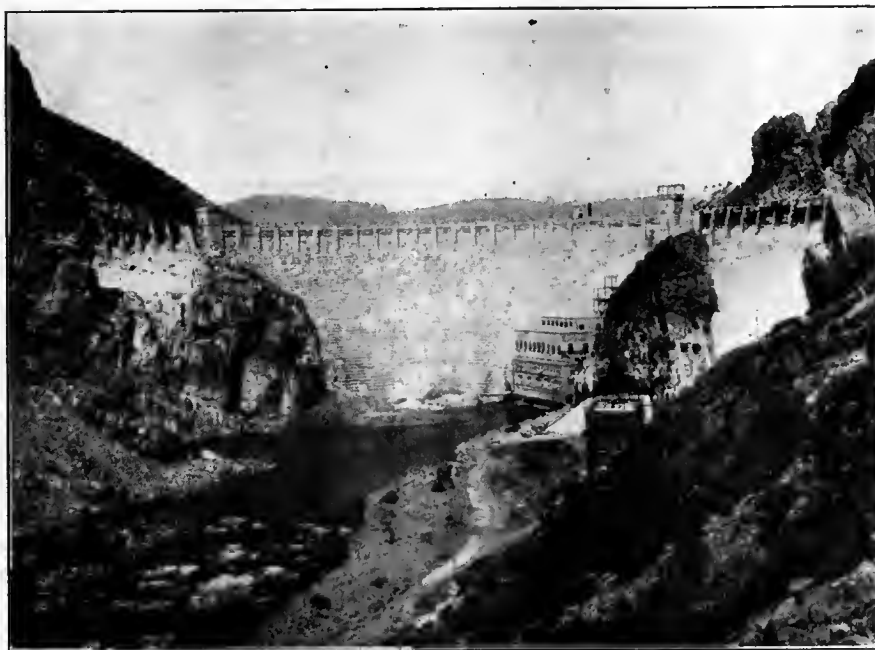
The various committees dealt with the size of farm units to meet the needs of settlers with varying capital and labor in the family, the cost of clearing the land of brush and leveling it, and the cost of equipping the farm with buildings, machinery, and livestock. This was done to determine the amount of capital, together with credit available, a settler would have to possess to take one of these farms and successfully develop it. For the projects investigated a settler should have available capital ranging from \$4,000 to \$7,500. The average settler now seeking land possesses a small automobile, from \$1,000 to \$2,500 in cash, and perhaps enough furniture to

furnish a modest home. Only about 10 per cent of prospective settlers have a capital amounting to more than \$2,500.

Data were gathered on the amount of State and county taxes generally assessed, and an estimate made of the increase in taxes needed to provide additional schools, roads, and other civic improvements. To this were added other fixed charges, such as repayment of bond issues, existing or contemplated, estimated water charges, insurance, and interest on borrowed money. These fixed charges, plus operation and living expenses, were weighed against estimated incomes. Due consideration was given to the period of time that must elapse and the capital that must be invested before a farm could be made a going concern.

Markets and transportation were studied. The amounts of mortgages prevalent in the district were considered and the rates of interest and terms of repayment of both long and short time loans.

The conclusions of the local committees of business men and farmers who reviewed the reports in general coincided with the views of the men who made the investigations. This was especially gratifying, and added materially to the value of the reports, as these local committees were familiar with marketing conditions, selling prices of products, and freight rates in their respective localities.



Roosevelt dam, Salt River project, Ariz., showing Taintor gates



## SETTLEMENT PLAN INDORSED

THE settlement plan published in the June issue of the *NEW RECLAMATION ERA* is commented upon as follows by one of the most effective colonization agents in the employ of one of the transcontinental railroads serving a number of the irrigation projects of the bureau:

"I fully agree with Mr. Kreutzer's ideas as in part they are in line with what we have advocated for a long time. We take the position that communities must cooperate in the settlement of their vacant lands with the railroad and maintain that their interest is as great as ours; consequently they should share in the responsibility of bringing about farm-land settlement. To such communities we say that we will go with them on a 50-50 basis, but only with the understanding that the lands to be offered must be selected by a competent committee,

prices must be reasonable, deferred payments extending over a period of years, and when the new settler does arrive it is somebody's business to interest himself to see that he is properly taken care of and given some service in getting started right.

"We usually work through the chambers of commerce, who are responsive, and the fact that they take the lead in the community inspires confidence in the mind of the prospect, as he realizes he is not dealing with a real-estate agent, at least to begin with. Some of these chambers of commerce have a list of all lands that have been passed on, which are submitted to the prospect making inquiry or making personal call, and if interested they can call upon any local real-estate firm who has the same listings and in no case can a greater price be charged than the option calls for, and in case of sale the real-

estate man collects 5 per cent commission from the owner.

"The chamber of commerce can not take it upon itself to actually sell land, but they will see that the prospect is fairly treated and if then given the right kind of service we minimize failures to some extent. The new settler should be guarded against overbuying, and in the event of purchase of dairy cattle he should again be protected, not only as to prices but to see that all cows have been properly tested.

"To get anywhere at all in farm-land colonization, we can no longer proceed on the old time 'slipshod' methods, which is simply to sell land, take the profit, and let the settler work out his own salvation as best he could. We find colonization becoming more difficult as we go along; people are harder to move, there are fewer of them, and unless the proposition is unusually attractive and we are prepared to give the prospective settler real constructive service and protect him, so far as we can, not only against fraud but also excessive interest charges and other costs, we can not hope to make any progress."

## EVAPORATION AFTER IRRIGATION

THE direct evaporation of water from the ground surface may account for 10 to 40 per cent of the water applied, as pointed out in Bulletin No. 101 of the Agricultural Experiment Station of Arizona. This loss is much larger on heavy loams and adobe soil than on sandy soil. It is greatest, of course, during and just after each irrigation and decreases gradually until the next irrigation. In the case of alfalfa it is comparatively high after each cutting and decreases as the plants grow again and shade the ground. It is greater on an open, wind-swept area than on one protected by windbreaks.

Many methods for reducing the evaporation loss are available to the farmer. They are as follows:

1. *Deep plowing.*—A shallow seed bed underlain by packed soil tends to cause a high evaporation loss. From 7 to 9 inches of soil should be turned over by the plow.

2. *Cultivation.*—In the case of crops planted in rows, such as corn, the ground between the rows should be cultivated as soon as possible after each irrigation. In the case of orchards the ground should be furrowed just before irrigating and cultivated soon afterwards. If the furrows are 6 inches or more in depth one may expect to save a considerable percentage of

the loss which would occur without the mulch. Even alfalfa needs cultivation at least twice a year, and particularly after the soil has been packed by winter pasturing.

3. *Increase in soil fertility.*—It is difficult to make a mulch when humus is lacking. A fertile soil takes water readily, and if mulched on top retains it with comparatively little loss by evaporation. Straw should be spread on the ground and plowed in. Weeds, trash, and green manure crops can be utilized to improve the fertility. All stable manure should be spread and plowed into the soil.

4. *More thorough and less frequent irrigation.*—This practice, besides saving water, tends to establish deep root feeding, whereas frequent light irrigations encourage shallow roots. For alfalfa one irrigation per cutting is ample except for sandy soils, where two lighter irrigations are usually necessary.

5. *Irrigation at the right time.*—Irrigate heavily before planting and withhold water after the planting for a considerable time. In the case of alfalfa irrigate about a week before cutting. This will supply the water when it is most demanded for plant growth, and after cutting, the ground being still moist, the new crop will spring up quickly and shade the ground. Wheat should be planted in thoroughly

irrigated ground, and with the aid of good winter rains no irrigation is needed until the boot or flower stage. Cotton should be irrigated sparingly in the early stages of growth.

6. *Irrigation at night.*—Evaporation is much restricted in the night as compared with the day time. It is a great mistake to shut down pumping plants each evening.

7. *Elimination of weeds.*—The waste of water to raise weeds should be included with evaporation losses. Weed farming is unprofitable.

8. *Windbreaks.*—They should be planted along the roadsides. Every farmer should raise his own fence posts and firewood. Wind movement in the Salt River Valley is greatly reduced by the long rows of trees with which the landscape is checkered. The near-by fringes of fields require additional fertilization, but the net result of windbreaks is beneficial.

A dairy barn doesn't need to be costly to be clean.

You must like cows if you expect them to make a profit for you. Then you have got to study and understand them and all that goes with their breeding, feeding, and care.

A livestock sermon in six words: Better sires, better stock, better success.



## DOMINICAN REPUBLIC COLONIZATION

**T**HE budget of the Dominican Republic for the year 1925 includes an appropriation of \$250,000 for irrigation projects and \$50,000 for the colonization of the irrigated areas, both sums to be expended under the administration of the Department of Agriculture and Immigration of the National Government.

The following is from a statement commenting on the above, prepared by the Department of Agriculture and Immigration:

A real necessity exists for the irrigation of a large part of our arid lands. By so doing we may place the majority of our rural population in a position to produce constantly and methodically without being dependent upon the rainfall, which has been very irregular during the last 10 years.

Only by irrigation and facilities for colonization, grouping people together in limited areas where school instruction can be furnished their sons, may we prepare them for a less difficult life, less charged with penalties, and beneficial to the country and to themselves.

Colonization will permit us to give direct objective instruction to each farmer by means of competent agricultural instructors given the facilities of convenient demonstration areas and able to direct the preparation of the land, the planting and harvesting, and finally the preparation of the product for the market.

It will facilitate the measures to increase production, particularly when such increase is based upon changes in the crops to be raised and in methods of cultivation.

It will facilitate the education of the children of this generation, who must be the agriculturists of the future, training them for better production, making them better citizens, and capable of conserving our country.

It will permit us to establish cooperative associations to assist farmers and gather together and classify products in large quantities, thereby increasing their market value and enabling us to compete successfully with other countries at present better organized than ourselves.

These colonies will be established in proportion to the carrying out of these irrigation projects, choosing for each the land offering the best facilities for preparation and the greatest assurance of satisfactory results from the work of the colonists.

Each colony must be established, organized, and regulated in its work before proceeding with the establishment of others, always excepting unforeseen circumstances which might counsel a different attitude by the Secretary of Agriculture and Immigration.

Each organization or colony must be based upon the establishment of a school, police protection, and a technical director of agricultural work. Cooperative associations should be formed and in a manner to permit efficient supervision of production.

The cooperative associations will be charged with the duty of selecting seeds and distributing them to the farmers as loans. The agricultural instructors will select the seeds which shall be used for planting to best advantage and available ground; and in order to stimulate production, every effort shall be made to obtain for the producer the best price offered for either domestic consumption or exportation.



Irrigation canals in the Dominican Republic

## COLORADO TON-LITTER CONTEST

**T**HE plan of the Colorado ton-litter contest in 1925 is to encourage farmers to produce a litter of pigs the aggregate weight of which shall equal or exceed 2,000 pounds in six months. The contest is being conducted on a county unit basis; that is, the farmers compete within the county and the several counties in turn compete for State prizes.

The objects of the contest are (1) to demonstrate the commercial value of better sires, (2) to demonstrate methods

of feeding for cheap and efficient production, (3) to demonstrate the value of saving a larger percentage of pigs at farrowing time, and (4) to arouse greater interest in hog production in Colorado.

Cash and other prizes will be awarded by the local county organization, the Denver Chamber of Commerce, the Denver Union Stockyards Co., the Colorado Bankers Association, and Mr. W. N. W. Blayney, of Denver.

A number of entries have been made by farmers on the Uncompahgre project.

H. A. Ireland, associate agriculturist on the project, has furnished the following additional information concerning this contest:

"We have secured more than the required number of entries in both counties so that the contest is assured.

"We are especially emphasizing the care of the sow for the sake of saving the maximum number of pigs as a means of realizing a greater net return per sow, and hope by keeping feeding records of these litters to demonstrate that there is a profit in quick finish of pigs for market."

Reports on weights and the eligibility of litters to an award are to be certified by the county committee and forwarded to the State committee not later than November 10, 1925.



Strawberry Valley project lands viewed from the High Line Canal

## LAND DEVELOPMENT POLICY IN ITALY

The following is from an article in a recent issue of the *International Review of Agricultural Economics*, discussing the agrarian policy in Italy:

"Under a comprehensive betterment scheme, the land becomes, as it were, an object on which human constructive skill is exercised through a series of modifications and developments. The work of transformation is in part undertaken by the State, under the form of the more important and striking works of public utility, including the regulation and utilization of water courses, and in part by

private individuals in the form of farm buildings, plantations soil improvements, etc., the whole being coordinated under a single general plan by which the original area, hitherto uncultivated or abandoned, and malarial, is adapted, restored to healthy conditions, and practically reconstructed by human effort, so that it becomes not merely an area of intensive cultivation, but one whereon the higher forms of social life may flourish.

"Those public works which are an essential prerequisite will no longer be carried out independently and without due regard to the proposed changes in the systems of cultivation; they will be brought into close relation, and the one regarded as the essential outcome, the mathematical 'function' of the other."

## ORLAND DELINQUENTS ARE URGED TO PAY UP

That the Orland project is determined to maintain its enviable record of meeting its payments to the Government is shown by a recent letter, addressed by the Orland Water Users' Association to "those shareholders who have not yet made remittance for the 1924 operation and maintenance charge."

Pointing out that "Congress and the Budget Bureau will lend a more sympathetic ear to our request for additional funds if this charge for an adverse year like 1924 has been met," the association urges these water users "to invoke every resource at your command for making prompt remittance for the unpaid operation and maintenance charge."

## COMMISSIONER MEETS SOUTHERN GOVERNORS

On May 28 Commissioner Mead held a conference in Washington with Governor McLean, of North Carolina, Hugh McRae, of Wilmington, N. C., and others on matters relating to investigations of settlement problems with a view to presenting a definite policy to the Bureau of the Budget in accordance with the legislation of December, 1924, authorizing an appropriation of \$100,000 for the investigation of how arid and semiarid, swamp, and cut-over lands may best be developed.

On June 2 the commissioner attended a similar conference in Columbia, S. C., with Governor McLeod and others interested in the State's settlement and development program.

## COLONIZATION BY FRENCH IN ALGERIA

In a recent publication concerning the new regulations for the colonization of Algeria by French settlers, by Bernard Augustin, the fact is stressed that it is useless to give land to persons who have not the means to bring it under cultivation. "Before the war applicants for free grants of land in Algeria were required to possess a sum of 10,000 francs; to-day 25,000 francs are required, and a much stricter inquiry is made into qualifications than was formerly the case. A minimum expenditure of 40,000 to 50,000 francs is now indispensable for bringing an allotment of land under cultivation.



Wheat field, two years in cultivation, on the Minidoka project, Idaho

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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....., Solicitor for the Interior Department; E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary;  
W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

D. W. Davis, Director of Finance

P. W. Dent, Assistant to the Commissioner

C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; J. R. Ummel, Chief Clerk; Harry Caden, Fiscal Agent.

George C. Kreutzer, Director of Reclamation Economics; Andrew Weiss, Assistant Director of Reclamation Economics; B. E. Hayden, Industrial Agent; C. R. Trowbridge, Inspector.

Board of Survey and Adjustments

Thomas E. Campbell, Chairman Southern Division

John A. Widsote, Chairman Northern Division

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....		Brooks Fullerton.....	Mitchell, Nebr.
Boise.....	Boise, Idaho.....	J. B. Bond.....	E. R. Mills.....	C. F. Weinkauf.....	B. E. Stoutemyer.....	Boise, Idaho
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	V. L. Minter.....	V. L. Minter.....	Ottamar Hamel.....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	A. R. McGinness.....	J. P. Siebeneicher.....	Miss M. C. Simek.....	E. E. Roddis.....	Billings, Mont.
King Hill.....	King Hill, Idaho.....	G. H. Harris.....	E. V. Hillius.....	E. V. Hillius.....	B. E. Stoutemyer.....	Boise, Idaho.
Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	H. C. Melaas.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Schepplmann.....		E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	G. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	H. W. Bashore.....	L. H. Mong.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennleott.....	Ottamar Hamel.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	V. E. Hubbell.....	Brooks Fullerton.....	Mitchell, Nebr.
Salt River <sup>1</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>2</sup> .....				
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	W. C. Berger.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	G. O. Patterson.....	C. M. Voyer.....	H. L. Holgate.....	Portland, Oreg.
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Williston.....	Williston, N. Dak.....	W. S. Arthur.....	W. S. Arthur.....		E. E. Roddis.....	Billings, Mont.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho.	F. A. Banks <sup>2</sup> .....	H. N. Bicket.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo.....	F. F. Smith <sup>2</sup> .....	Chas. Klingman.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>2</sup> ..... Ralph Lowry <sup>2</sup> .	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.

<sup>1</sup> Project operated by Salt River Valley Water Users' Association

<sup>2</sup> General Superintendent and Chief Engineer.  
<sup>3</sup> Resident Engineer.

<sup>4</sup> Superintendent of Construction.

The NEW RECLAMATION ERA is issued every month by the Bureau of Reclamation of the Department of the Interior, Washington, D. C. It is printed by the Government Printing Office, Washington, D. C.

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*WE are only just beginning to realize that our future is likely to be determined primarily by the relation of the people to the land. We have often stated, but little heeded the facts that we are ceasing to be a land-owning nation and that the land-born are drifting to the cities. We have yet to learn what the older countries of the world already know—that keeping people on the land in the years to come must be one of the main endeavors of civilized nations. People can not be kept on the land where nonresident ownership and tenantry prevail. Nothing short of ownership of the land one toils over will suffice to overcome the lure of the city. At any sacrifice, at any cost, the people who farm the land must be enabled to own it. On such ownership the life of a modern nation may depend.*

*ELWOOD MEAD,  
Commissioner, Bureau of Reclamation.*

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NEW

# RECLAMATION ERA

VOL. 16

AUGUST, 1925

NO. 8



TIETON DAM, YAKIMA PROJECT, WASHINGTON  
Dedicated July 2, 1925



*PEOPLE, like animals, are found in greatest numbers where food is easiest to obtain. They, too, are gregarious. Our rapidly growing population and citizenship must be provided for in advance. We should locate its necessities and conserve that which can not be reproduced. It is said that 38,000,000 acres more will be needed for crops in 1955, with no increase in our imports, to feed the normal increased population.*

*Our reclamation projects, which are of engrossing concern to me, have 6,609 unoccupied farms of varying size, or 564,000 acres—more than 14,000 potential farms of 40 acres each. How we can put farmers on this land who will produce foodstuffs in lieu of what we are importing is our big problem.*

*The United States last year imported about \$425,000,000 worth of crude foodstuffs and food animals, exclusive of wool and cotton. It is idle to change our production of farm products and limit them to compel higher prices until we are producing more than we consume.*

*HUBERT WORK,  
Secretary of the Interior.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

AUGUST, 1925

No. 8

## NEW METHODS MUST BE APPLIED TO NEW CONDITIONS

*Formerly the Government gave nothing and exacted little. To-day the Government gives land and advances millions without interest, but expects the principal to be returned on installments*

*Speech by the Secretary of the Interior, at Great Falls, Mont., June 26, 1925*

CONGRESS in appropriating money for completing the Sun River project made it a partnership development. The conditions of this appropriation require the Bureau of Reclamation to build the reservoir and complete the canals; afterwards the State of Montana to subdivide the 40,000 additional acres that will be reclaimed, find the settlers, advise them, and advance money to equip their farms. Before we begin there should be a complete understanding regarding this development, and I have invited the governor to go over the project with me so that together we can study conditions, form some idea of the possibilities, and then determine whether the plan outlined by Congress ought to be adopted, or, if it is not satisfactory, agree on what recommendation should be made to Congress, construction to be postponed until there can be further legislation.

It is not necessary, however, to inspect the Sun River project to know that changes are needed in the settlement clauses of the reclamation act if development is to go on in the Rocky Mountain States. The conditions in practically all the northern tier of States show that under the act Federal reclamation has not produced the desired agricultural results. It has not given the industrious, experienced settler the kind of an opportunity he should have. It has given too wide a range to land speculation. It has bred the menace of tenancy.

Instead of the settlers on these projects having a sense of gratitude to the Government for what it has done for them, the letters and petitions which come to the Department, and the statements which appear in the press show that disappointment and bitterness prevail to an extent.

We ought not to go on with a policy that creates these results. The question is, What can we wisely and safely under-

take to improve these conditions? Solvency in future development requires that we do something. I have no fixed theories to impress on you; I want the use of your minds and experience. It is your problem primarily and I am offering the weight of the department to help solve it. There has already been spent on the four projects of this State, for construction, \$16,000,000. Of that only \$628,000 has been repaid, and on four important divisions not one dollar of construction costs has been returned. It has cost to operate these projects \$2,-\$76,500. Of this only \$926,300 has been collected. All the money that has been received would not repay the Government what it has expended in operation and maintenance. An irrigation work that is not worth enough to pay for its operation should not be continued.

Acting on this conviction, we are arranging to sell the Williston project, and we have to seriously consider whether the same action should not be taken with regard to the Lower Yellowstone project, where, out of \$968,000 operating costs to December 31, 1924, only \$174,000 have been repaid, the deficit to-day standing at \$794,000.

### FINANCIAL OUTLOOK GOOD FOR FARMERS

*Good financial prospects for farmers this year are predicted by the United States Department of Agriculture in a recent report on the agricultural situation, in which the statement is made that "given strengthening livestock markets and fair feed crops, plus fair returns from wheat and cotton, farmers will come out of 1925 better than they have in most of the years since 1919."*

These results are not believed to be due to lack of agricultural resources. They are the result of too large holdings, lack of belief in the necessity for irrigation, poor cultivation, inflation in the prices of privately owned land, and the lack of capital and equipment needed by settlers to enable them to cultivate their land as irrigation requires.

We believe that the time has come when we must place more emphasis on the problems of farm development. It is a new idea in this country, because for so many years we had free, fertile land to give away; but with project costs continually increasing and costing more than developed farms in some older sections of the country we must now begin to think of what is needed to develop earning power and to speed up settlement and farm development which measure earning power.

We want to hear no objection to financial aid in the improvement and equipment of farms, assuming that it will be conservatively and wisely administered. The objection that it is paternalistic applies with greater force to aid in building canals, and especially where the land under those is held in large tracts by private owners. If we can develop a system by which the money advanced for farm improvement is to pay interest and be used to improve land that belongs to the Government, and the expenditure watched by practical business men, it would seem a common-sense business like policy. Where it has been tried it has given results that suggest its trial on this project.

Speaking broadly, with the whole country in mind, something must be devised quickly that will check the flow of farmers to the cities to become day laborers. We can never inaugurate a back-to-the-farm movement, but have

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## MANY AGENCIES ENLISTED FOR DEVELOPMENT OF WEST

*No man builds houses to rent unless there are renters, and Congress will not open up new farms unless there are prospective farmers who will live on them*

(Continued from page 113)

hopes that a stay on the farm may be made more attractive.

In considering new projects we must remember that thousands of farm areas under Federal irrigating ditches have never been farmed; other thousands have been abandoned; that about a half million farms in the United States were abandoned last year; that railways that once were our best aid for settling the West can not now carry people who will not ride, and they are not interested in peopling land with those who can not produce any freight for them to haul. We have for months been trying to interest the immigration agents of the different western railroads in securing settlers for our projects. We have urged high officials to meet with us to discuss the problems of reclamation on the ground. They are enlisted with us for the common purpose of developing the West. We are in the position of having something to sell to Congress, and we must be able to show Congress that we have men enough in sight or coming to work these projects, or it will not advance money to develop them. No man builds houses to rent unless there are renters, and Congress will not open up new farms unless there are prospective farmers who will live on them.

Farming when the original 13 States were settled, and for a long time afterwards, was regarded only as a mode of living. If a farmer could clear his land of timber, raise his family and school them neighborlike, he was regarded as a good citizen and a successful man. He had no help from his neighbors; he was not disposed to return it in kind, in raising a barn, rolling logs to burn on a clearing or perhaps a husking bee, unless sickness overtook him; then all would volunteer to keep up his seasonal work.

The Government did nothing for him except give him land at nominal cost and levied taxes. Although very low, they were then harder to pay than now, because money was rarely seen.

Each family then lived within itself. Their cellars and barns were filled during the summer for the winter's consumption. Industry and thrift were then instilled and ingrained in the youth.

Now our complicated manner of living, an outgrowth of our evolving civilization, has transformed farming and its methods into a science and realization of its profits into a business.

Farmers expect to make money from farming after the actual daily necessities of living have been met, and they must do so to live by the same standards set by the villagers whom they support. The most timely and important institutions of learning to-day are the land-grant or agricultural colleges fostered by the Government since 1862. I have wondered why they provide such a diversity of teaching, from swine breeding to voice culture, when they are supported by sale of land, and agronomy is the most vital science in this world to-day. But I am told that culture is necessary to good homes, and it is, but much of it bears no relation to farming and culture and training of the mind may be had from practical instruction, useful in making a living from the soil.

To-day and particularly on irrigated lands we must apply new methods for new conditions. Contrasted with the old practices, where the Government gave nothing and exacted little, are situations to-day where the Government gives land and advances millions without interest, but now expects the principal to be returned on installments.

The land the Government has offered has been for the most part fertile, cleared and ready for the plow. Returns from its utilization have been almost immediate, compared to the wresting of a few acres each year from the forests for crop growing. But the irrigation farmer was met with obstacles on many projects as hard to overcome as the forests were. He was often without the experience gained from farm life from childhood. He had to unlearn the shameful, blue sky propaganda, through which he was induced to locate on raw land liable to seepage, and some of it unproductive. He almost lost his faith in his Government because of the specious promises made by its representatives and local land agents, and often felt that reassessments were laid to cover estimate mistakes believing that since he had already located he would acquiesce in them rather than abandon his prospects for a farm home.

It is these unfortunate attitudes of mind and conditions we have set ourselves to change and correct. For six months six able men studied the Federal reclamation wreck for the Department of the Interior—the president of the National Farm Bureau, a former Secretary of the Interior, an eminent irrigation lawyer, a distinguished international student and

writer on irrigation, an engineer, a foremost citizen in an irrigation State and the present Commissioner of Reclamation, admittedly and at the same time a master sociologist, economist, reclamationist, and engineer. The term engineer in the Reclamation Service must be made to mean more than a dam builder or an engine driver. It must mean an efficient manager from now on, if reclamation is to succeed.

Two of these men are canvassing old projects to study and determine if it is impossible for settlers to pay the costs and charges assessed against them. Each project is being reviewed and a separate report will be made to the Department. We are making at this time a study of proposed new projects, their physical features, fertility, length of growing season, crops adapted, markets accessible, financial requirements of settlers, etc.; but my principal concern is to discover the attitude of the people locally—whether or not they believe a project to be feasible. For I must certify to the Congress on this point. Whether the land is being held for speculation, whether those living in town realize that the success of a proposed project is vital to them, whether the business men are disposed to exploit the new venture, to get the money appropriated by the Government immediately, or treat these new settlers as neighbors and community assets and not as voters to be cajoled or strangers to be preyed upon.

It is of vital moment to the future of Federal reclamation that we first reclaim reclamation, that we restore lost confidence in its Government representatives, reestablish the enthusiasm brought onto projects by settlers, and discredit those who live by farming the farmers.

Irrigation has done much toward opening up new countries. I believe in it and want to further it, but I am not willing to let Federal reclamation continue to ride recklessly to its own ruin without an effort to save it to those who by their courage and industry have earned the right to home ownership.

We are making this inspection of proposed new projects with the idea of building them and to get acquainted with the conditions on each one, particularly its people, for on their attitude will depend the ultimate results of the venture.

The total horsepower used annually on farms amounts to nearly 16,000,000,000 horsepower-hours.

## THE FUTURE OF IRRIGATION DEVELOPMENT IN MONTANA

*Better results for everybody will be had if the money needed to supplement settlers' capital, so that farms can be promptly and properly improved, is provided before construction is started*

*By the Commissioner, Bureau of Reclamation*

**T**HE mean value of the crops grown on irrigated land for the four projects in Montana for 1924 was \$24.77 an acre. That was an average, but on these projects there were farms where the value of crops raised was close to \$100 an acre. Some farms are used to grow alfalfa and sugar beets, with satisfactory results to the grower and to the Government; on the other hand, large areas are used to grow blue-joint hay or are not irrigated at all. It is those areas which bring down the crop averages.

There is no question that irrigation in Montana has suffered because it has rained enough to encourage people to neglect irrigation and depend on the clouds. This uncertainty has done much to delay development, because the land is being irrigated without being properly prepared and is used to grow crops of low acreage value because they will stand neglect and do not require the physical effort demanded in the cultivation of many of the more high-priced crops.

For the last year we have been making an economic study of these projects to find out what can be done to increase the value of crops, the number of people on the land, and the returns to the Government. The irrigation possibilities of the State are such that reclamation ought to be a success, but these possibilities will not be realized in the next 50 years if we follow a course of drift and inaction. We must deal with settlement and farm development as fundamental problems which need attention equal to that given the design and construction of new works. We must put an end to supplying water to people year after year without requiring them to pay for it. That only encourages delay in development and is an injustice to those settlers no better off who, year after year, have made sacrifices to meet their obligations to the Government.

Cooperation with the State, with the landowners in securing settlers and in farm development, must also be adopted as fundamental features of our policy. At a conference in Chicago last March we took it up with the colonization departments of all the western railroads, and through correspondence and conferences since the director of reclamation economics has been endeavoring to work out a settlement and farm development program for each of these projects.

### RESULTS OF A RECENT INSPECTION

We hope and expect that in this movement we will have the active cooperation and support of the State. Some conclusions as to what is needed, reached by the director of reclamation economics on a recent inspection of these projects, will be given. Speaking of the Lower Yellowstone, he says:

This will be a very fertile field for settlement because the project costs are low and the type of soil is excellent. In addition to this, some of the farmers are intensively cultivating their land. They have about 8,000 acres of beets planted this year and 1,700 acres of canning peas for seed. The peas were up and looked fine. The fields had been carefully prepared and showed that knowledge and experience had been used in planting and caring for the crops. This was a great contrast to the Sun River and Milk River projects.

I was very agreeably impressed with the agriculture of this section. It is going to make a fine project, and we can safely encourage settlement from every angle. Their committee will soon interview landowners and tie up a large acreage for settlement.

That poor financial returns on Montana projects come from delayed farm development is shown by a study of conditions on the Milk River project. Speaking of this, the director states:

I met with the Glasgow Chamber of Commerce in the evening and found there a favorable atmosphere. The Great Northern has been very active in bringing in beet workers some of whom will no doubt become farmers in the future.

However, this whole project lacks an adequate and intensive agriculture and what can be accomplished on reasonably sized farms.

If we had 10,000 acres of the best land developed along the line of the Durham State settlement in California, I believe it would solve the problem. Now a new settler comes in and is surrounded by thousands of acres of "Blue joint" and will find very few neighbors interested in intensive agriculture.

In the Milk River Valley there are probably not more than 100 farms on which the expenditure for leveling, ditching, and diking has amounted to as much as \$15 or \$20 an acre. The remaining 500 farms vary from raw land to land only partially improved.

The average size of the farms is about 250 acres, although there are a number of 160-acre homesteads. On the other hand, about 120 men on the project own 45,000 acres of land, or an average of 375 acres.

About 88,000 acres under present constructed works are in private ownership, at least 50,000 acres of which are in need of settlement and would accommodate 300 families.

A study of economic conditions is being made on Sun River, because the last Congress appropriated \$500,000 for the construction of an additional storage reservoir. About \$4,500,000 has been spent for construction on this project. To complete it will require about \$5,000,000 more. Before entering on a work requiring so large a sum we ought to have a

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A flock on every farm should be the slogan of the irrigation farmer

## SUCCESSFUL DEVELOPMENT DEMANDS DEFINITE PROGRAM

*Such a program of aided and directed settlement is new in the United States, but it is the central idea in irrigation development in other countries*

(Continued from page 115)

definite program of development which contemplates not simply the building of canals but settling the land, improving the farms so that they are going concerns and able to support the families living on them, and helping them meet their payments to the Government.

About 100,000 acres of land will be brought under settlement on the Greenfields division of this project. This will require about 1,000 settlers. Carefully prepared estimates show that to improve and equip these farms for intense culture will cost on an average \$5,000 for each 80-acre farm. The settlement records of the bureau show that 70 per cent of the applicants who apply for land have less than \$2,000 capital and only 10 per cent have over \$2,500. If we are to base our plans on finding people with \$5,000 of their own, we will almost certainly fail. Development will be so slow that the Government will lose heavily and the settlers living on the project will have to pay burdensome construction costs.

A more sensible plan is to base our settlement program on securing settlers with from \$1,500 to \$3,000 capital, but if we do this we must provide a fund to be used in making advances to supplement the settlers' capital in the improvement of their farms. If the settlers who come to this development bring half of the money needed for farm improvement, they will bring to the State between two and three million dollars, and if we are to give them a real opportunity in inviting them to come here, we must provide from some other source between \$2,000,000 and \$3,000,000, to be used in advances for building houses and fences, leveling land, and helping settlers get their needed equipment.

### A DEFINITE PROGRAM ESSENTIAL

Such a program is new in the United States, but it is the central idea in irrigation development in other countries. The need for such an agricultural program has been abundantly shown in the past history of the Sun River project. Although this land was reserved for irrigation and settlers knew that it was to be an irrigation project, when they came there was no definite farm program based on the kind of cultivation irrigation requires. Settlers began to farm much as they had in a country that depended on rain alone, and after the canal had been started and a large amount of money had been spent 75 settlers asked to be released from any

payments to the Government on the ground that irrigation was not necessary. This led to a curtailment of the construction plans. By 1923 all were convinced that dry farming was a failure and 185 landowners requested that a reservoir on Beaver Creek and the irrigation works as originally planned be built.

### TWO PROBLEMS TO BE SOLVED

To make this a solvent enterprise two problems must be solved. One is the refunding of the private debt of settlers now on the project so they can have more time. The other is to work out a program for the new development. Last year I talked with scores of settlers about their problems. I wanted to find out why payments due the Government were not being made. One settler who had borrowed \$5,000 to complete the improvement of his farm was paying 8 per cent interest; the mortgage was overdue; it could be foreclosed at any time. He had no heart to go on.

A settler at Milk River started without money to buy and improve a farm. He had teams and tools but no working capital. He expected to get along while growing a crop by having credit from the local grocer and from the man from whom the land had been purchased. He had planted part of his farm to beets, which require intense cultivation. The seed bed needs to be properly prepared. The crop needs to be thinned, cultivated, and watered at the right time and in the right way. He had arrived late. His beet field had not been properly leveled. It was needing both cultivation and water, but the men on whom he relied for credit could not keep their promises and he had been obliged to leave his farm and go to work for wages. Every day's labor on that beet field would have been worth three or four times what he could possibly earn in wages, but it was a choice between abandoning his crop and starvation. Many settlers were in the same condition, and the wonder was that we were getting any money.

We find many settlers now on the project are in serious financial difficulties. Private debts on the Greenfields division amount to over \$300,000, largely secured by mortgages on their farms or their personal property. This indebtedness and the payment of interest on it has prevented the proper improvement and equipment of farms and is one of the causes for the low acreage value of crops

and for the failure of settlers to meet payments to the Government.

Notwithstanding these unfavorable conditions the Secretary last year recommended that money be appropriated for completing the project, basing his action on the fact that a fine body of settlers are now on the area. They can not prosper with the canal in its present condition. With farms properly improved this project can be made a center for diversified farming, for fattening sheep and lambs, producing milk for butter and cheese making, and growing alfalfa, potatoes, and sugar beets. Large yields of grain can be secured in crop rotation. This is the kind of farming practiced around Greeley, Colo., where land is high priced and farmers are prosperous. Sugar beets are a profitable crop under irrigation in Montana. Three of the four Federal projects in this State have beet-sugar factories. Growing sugar beets makes good farmers; the crop compels it.

I talked with bankers at Greenfield. They are keenly interested in the welfare of settlers. One said, "The project needs sheep. If every farm had 50 sheep to eat up the surplus fodder, they would bring in enough money to pay the irrigation costs." He said, "If I had the money or the bank could spare it, I would advance to 100 settlers enough to buy 50 sheep for each farm, but the bank does not have the money. It has loaned all it can spare to the settlers on the project."

Recently there has been a gratifying awakening in Montana to the need for improvement of farms and extension of intensive cultivation. Vice President Gilman, of the Great Northern Railway, has taken a paternal interest in the Milk River project. He has spent money in getting options on large tracts of land. He has struggled with owners to get them to reduce the prices of this land and to give settlers better terms. He has spent his money and has passed around the hat to provide money to bring in farmers who would cultivate the land as tenants or buy on long-time contracts.

I admire what he is doing and will do all I can to help him succeed, but I have no confidence in a hand-to-mouth development of farms where millions of dollars are needed. Better results for everybody will be had if the money needed to supplement settlers' capital, so that farms can be promptly and properly improved, is provided before we start construction. I do not care whether the money comes from the State or the reclamation fund, so long as it is assured.



## BUMPER CROPS ARE PREDICTED

**A**GRICULTURAL conditions on the projects at the close of June indicate that bumper crops, good prices, and widespread optimism among the farmers will be the outstanding features of this season.

*Yuma project, Arizona-California.*—The melon season was well advanced and prices were good, growers profiting by the poor crop in Imperial Valley. Shipments comprised 125 cars of watermelons and 129 cars of cantaloupes. Alfalfa seed was being harvested at 16 cents a pound. Four thousand five hundred pecan trees had been planted. A fair stand of cotton was in normal condition. All orchards on the Mesa were showing vigorous growth.

*Orland project, California.*—A fair second crop of alfalfa was harvested. All apricots had been picked and largely marketed at attractive prices of \$42.50 to \$43 a ton. Indications pointed to a light almond crop, although the nuts will be large and of good quality.

*Grand Valley project, Colorado.*—Harvesting of the first cutting of alfalfa, digging early potatoes, and cultivation and irrigation of sugar beets and other crops were in progress. Alfalfa produced a satisfactory yield. Potato growers were optimistic over the crop, the price of which ranged from \$2.10 to \$2.50 per hundredweight. The sugar factory reported that beets never looked better.

*Uncompahgre project, Colorado.*—Crops were in excellent condition and yields were expected to be higher than the average. The first cutting of alfalfa was heavier than normal. The price of wheat ranged from \$2.50 per hundredweight for soft to \$2.65 for hard. Onion buyers were offering contracts at \$1.50 to \$2 per hundredweight.

*Boise project, Idaho.*—The first cutting of alfalfa was in the stack and the second cutting was making a fine growth. Barley was being cut and promised good returns. The hay and grain crops were far above normal. Apple orchards were doing well.

*King Hill project, Idaho.*—All grain and corn was in excellent condition and it was expected that this will be the best grain year for the project in a number of years. The first cutting of alfalfa was a little short. A larger acreage than usual of the second crop will be used for seed. Shipping of potatoes is expected to begin shortly.

*Minidoka project, Idaho.*—All crops were in a healthy condition. Wheat made an excellent showing. The first cutting

of alfalfa had been harvested and the second growth was making good progress. New potatoes were being dug for local use, and peas, lettuce, onions, and other garden truck were available in abundance.

*Hunley project, Montana.*—General crop conditions were excellent. Alfalfa and small grains appeared to be the best in the history of the project. Sugar beets did not promise a very large yield.

*Milk River project, Montana.*—The first cutting of alfalfa produced a good yield. Thinning and weeding of beets were in progress. About 5,500 acres had been planted to this crop.

*Sun River project, Montana.*—Crops were in excellent condition. The first cutting of alfalfa started about the middle of the month, about 10 days earlier than usual. Early grain crops were beginning to fill. It was expected that the sugar-beet crop will prove profitable.

*Lower Yellowstone project, Montana-North Dakota.*—All crops were growing rapidly after a late start due to frost and dry weather. A heavy first cutting of alfalfa was nearly all in the stack. Peas, beets, cucumbers, and small grain were making excellent progress.

*North Platte project, Nebraska-Wyoming.*—Crop conditions were very favorable. Small grain, corn, and sugar beets were 10 days in advance of the ordinary season, and bumper crops were indicated. Favorable prospects for good prices resulted in a feeling of optimism among the farmers and business men. Many inquiries were received from Colorado feeders as to the availability of alfalfa hay for cattle and sheep feeding this winter.

*Newlands project, Nevada.*—Harvesting of the first crop of alfalfa was completed. Grain was in excellent condition and the yield was expected to be heavy. Cantaloupes and other truck were making good growth.

*Carlsbad project, New Mexico.*—Crops in general were in need of water, the sup-

ply of which was short. As a whole, however, the cotton crop was in fairly good condition. Alfalfa in most cases was being left for seed, but the prospects were not very good.

*Rio Grande project, New Mexico-Texas.*—Some of the more advanced fields of cotton were in bloom. Stands of cantaloupes were exceptionally good. A large number of carloads of cabbages and apples had been shipped and pear shipments were expected to begin shortly.

*Umatilla project, Oregon.*—The second crop of alfalfa made rapid growth and was about ready to cut at the end of the month. New potatoes, strawberries, raspberries, and early apples were being marketed. Gardens made good progress.

*Klamath project, Oregon-California.*—The first cutting of alfalfa began at the end of the month. Crops in general were in excellent condition and a large crop was expected from the Tule Lake leased lands.

*Belle Fourche project, South Dakota.*—Crops were in excellent condition and well advanced. Small grain promised bumper yields. The first cutting of alfalfa was about 80 per cent completed. Rain delayed haying operations and caused some damage. Exceptional yields of sugar beets were anticipated from some fields.

*Strawberry Valley project, Utah.*—The first cutting of alfalfa had been completed and cutting and threshing of the pea crop were in full swing. The sugar-beet crop was in excellent condition with prospects of being the best in years. Wheat and grain were doing well. The cherry crop was poor and the apple crop fair. In general the crop prospects were above the average.

*Okanogan project, Washington.*—The apple crop was not so large as that of last year, but was expected to bring good returns.

*Yakima project, Washington.*—Crops were in excellent condition. The first cutting of alfalfa had been harvested, a considerable shortage being reported owing to winterkilling. A heavy cherry crop had been marketed, phenomenal yields being reported in some instances. Excellent prices were received, 280 cars being shipped at an average value of \$3,500 a car. Prospects were encouraging for a good apple crop. A good crop of apricots and a fair crop of pears will be harvested.

*Shoshone project, Wyoming.*—Hail damaged the crops severely on the Frannie division, particularly alfalfa, sugar beets, and grain. Crop prospects were excellent on the Garland division. The first cutting of alfalfa was about 50 per cent completed. The acreage in wheat and seed peas showed considerable increase.

## SOUTHWEST BENEFITS FROM RECLAMATION

As indicative of the value of reclamation activities in the Southwest, a recent report covering 1924 crop statistics for the State of New Mexico shows that the average value per acre of crops for the State of New Mexico as a whole was \$28.30; whereas the two counties of Dona Ana and Eddy, which are included in the Carlsbad and Rio Grande projects, averaged \$77 and \$76, respectively.

## LAND PROBLEMS SUBJECT OF COOPERATIVE ARRANGEMENT

*Contemplated work of the Division of Rural Institutions of the University of California and the Federal Land Bank of Berkeley described briefly by Charles H. West*

**T**O economize by avoiding the duplication of effort, the University of California and the Federal land bank about two years ago entered into a cooperative agreement for the gathering of data useful to both institutions. For the university the reports and studies that have been made the past two years are to serve as a background for future studies in land problems and land settlement. The work has given a picture of general economic conditions and will give an inventory of the State's unimproved and partially improved lands. In order to understand the problems of the State, it is necessary first to become intimately acquainted with existing conditions.

Success in loaning money depends upon the knowledge one has of the security, upon the knowledge one has of the problems of the community in which the security is located, and upon the integrity of the individual to whom the loan is made.

When the farm loan act was passed, the land banks were confronted with more business than the banks could handle for several years to come. Unlike our other large loaning institutions, they had no vast accumulation of information regarding the territory to be served, no well-trained personnel for the particular work, and no close contact with the problems and spirit of the community they were to serve.

The first problem of the banks, therefore, was to become acquainted with conditions in the territory to be served as quickly as possible. It will be remembered that in California nearly every type of agriculture is represented—humid farming, intensive and extensive irrigation farming, and dry farming. In addition the development of irrigated lands has been carried on through various types of State-created district organizations. In California there are a number of irrigation, reclamation, levee, and drainage districts organized under State law. The economic conditions in each district is a problem by itself. The cost of the construction, its quality and serviceability, must be analyzed in terms of the development. If agricultural development is slow, the cost of construction and especially the cost of water falls heavily on the small area intensively farmed. The cost of irrigation service must therefore be considered with the bonded obligation, and in some instances, where the indebtedness is small, expense for water, particularly where pumping is necessary, is excessive.

So far the work that has been done has consisted chiefly in reviewing the irrigation construction and associating the cost resulting therefrom with a type of agriculture and the extent and rate of agricultural development within the area.

This work has pointed out the necessity for solving many problems as valuable to

the prospective farmer and to the large land owner or land company contemplating the subdivision of land as to the Federal land bank. It is hoped that when the present type of studies is completed the Federal land bank will desire the continuation of this work to solve these problems. The Federal land bank has had two engineers in its employ almost since its organization gathering irrigation engineering data relating to the four States served, and although they are now fairly well informed their staff of well-trained appraisers is not as able to solve these problems as the university. Those conducting this cooperative work of these two institutions are crystallizing methods for getting these problems solved.

It is believed that in various parts of the State where typical agricultural industries are centered a thorough study should be made of conditions to determine how many of the farmers are succeeding, how many are barely making ends meet, and how many are failing, and what are the things that have contributed to the success or to the failure of these people. If these microscopic analyses of the internal condition of certain communities were before us as a guide, we could more intelligently compare conditions that are found in the partly developed areas. It has been surprising to find in some of our well-established areas a vast amount of land that is not productive enough to meet the district and county taxes and pay the costs of farming.

Secondly, in the State we find a vast amount of new development. The capital that a farmer needs in order to undertake development of a farm depends on the type of farming that he is going to follow. Evidently more money is needed for developing a fruit farm than to develop a dairy farm, and likewise more money is needed to develop a dairy farm than to produce farm crops without livestock. More information should be available for beginners, so that they will know what generally is required of farmers undertaking the development of different types of farming in order to bring the land to a point where it will be self-supporting. To make this material other than theoretical paper computations, field work is needed to determine what generally are the losses sustained by the average farmer from poor leveling of land, from inability to utilize to full capacity all his land for several years while it is being developed, losses due to change in the



A portion of the High Line Canal on the Strawberry Valley project, Utah

type of farming begun, losses due to inability to market what is grown, incidental and contingent expenses heretofore guessed at, etc. It should be determined from actual practice what factors or assumptions should be used in our computations. We must determine what percentage of the theoretical computations should the farmer under specific instances be expected to accomplish. This knowledge is essential to the Federal land bank, because it involves the question of the amount of equity a farmer shall have in his property when a loan is granted. Evidently if the farmer has not enough capital to see him through, the loan ultimately will become delinquent.

Third, in the State we have a large inventory of land provided with irrigation and reclamation construction that is awaiting development. The prices of land vary radically. In certain sections it is known that the price of land is far beyond its earning power. If the farmer pays too much for his land, he is beaten before he begins. The land price is based principally upon three elements—the productive capacity of the land, its location with reference to transportation, highways, etc., and upon the social environment in the community. The price of land when development is beginning should be a little less than its productive capacity. By this is meant the ratio of the capital and labor put into the land to the gross income derived from the sale of the products. This is the efficiency of the land. Studies should be made in various parts of the State to determine accurately what this efficiency is, so that it would be a guide for the newcomer and a guide to the banks in loaning money. California lands are overcapitalized. Banks authorized to loan 50 per cent of the value of the land generally loan about 30 per cent of the current sale price. The settlers and newcomers to California do not realize this.

The Federal land bank is mapping its territory to indicate the maximum loans that will be made in each classified area. This mapping can not be done from a technical standpoint. It is based largely upon the experience of the bank and the practice of other loaning institutions. Statistics have been gathered to show what other banks have loaned in the past years in various parts of the State. It is hoped that technical field determination can be made to demonstrate the productive value of farm land and by considering the business cycle the average earning power may be determined based upon a number of years. While the solution of these problems is needed by the Federal land bank, it is just as badly needed by the land companies promoting the sale

## SETTLEMENT ON RIO GRANDE PROJECT

**A**T THE end of the 1924 season there remained of the original Rio Grande project an area of approximately 30,000 acres susceptible of settlement and development. This area is composed of lands held by nonresidents or by local owners unable to finance the development cost.

Two organizations on the project, the Chamber of Commerce at Las Cruces and the Gateway Club of El Paso, have been very successful in attracting the proper character of settlers to the project lands.

The activities of the Gateway Club are particularly striking and noteworthy. This organization is financed by popular subscription from El Paso business men, and \$150,000 has been collected. This is being used in a campaign of national advertising and a follow-up system of correspondence. At the first of the year this

and subdivision of tracts of land and by the settlers taking up lands in California.

Beyond the scope of our work but related to the subject is a consideration of the economic condition of our various agricultural industries to know whether they are over or under developed—a thing that can only be worked out by associating statistics with a study of the condition of the producer. Land values are greatly influenced by over or under development of the industry in the country.

organization had received approximately 50,000 inquiries, to which activity may be attributed the bringing to the project of four or five hundred settlers.

The work of the Las Cruces Chamber of Commerce is of the same character, with more restrictions as to available funds and scope of its work.

With the introduction of cotton growing and successful yields and results obtained there was a natural tendency to obtain lands on the Rio Grande project by settlers from other districts, particularly from districts not so favorably situated as regards water supply, drainage, climate, and soil conditions.

The project office has assisted in the preparation of advertising data and in having settlers referred to the Bureau of Reclamation office by the two settlement organizations mentioned for more details regarding the irrigation and drainage system and general farming practice.

The settlement of the project lands, considering the advantages which the project has to offer, is not a serious problem; and as it is now being cared for by the Chamber of Commerce and the Gateway Club there is no requirement for particular activity on the part of the Bureau of Reclamation.

The farmer with several sources of income is the one who is reaping the largest profits.



On the Interstate Canal, North Platte project, Nebraska-Wyoming

## THE DESIGN AND CONSTRUCTION OF SMALL EARTH DAMS

*A nontechnical discussion of small dams and embankments of a type usually required for small farm reservoirs, such as can be readily constructed without elaborate equipment*

*By W. H. Nalder, Engineer, Bureau of Reclamation*

**I**RRIGATION farmers often find it necessary to construct reservoirs to store water, for irrigation or domestic and stock use, in order either to supplement the water regularly available from the company or Government ditch or to store such water for use between irrigation seasons or between periods of delivery from the ditches. Such reservoirs are naturally often provided by constructing an earth dam across the mouth of a small valley or other natural basin.

The construction of an earth dam of any considerable size or one that impounds any considerable volume of water should be done with great care. The investment is great, and the risk of losing this investment and the danger of imperiling the lives and property of others in the event of the failure of a dam should be carefully considered and amply guarded against. The various States have enacted laws placing the construction and maintenance of such dams under the supervision and control of the State engineer or other authorized official, and no person should proceed with the construction or use for the storage of water of any such structure, regardless of size, without first ascertaining that he is acting fully within the laws of the State.

Earth dams may vary in size from small canal banks to large reservoir dams, perhaps 200 feet or more in height. The

factors determining their individual design are numerous and are dependent upon such variable quantities as the nature of the foundation, the climate, the materials available, and the use to be made of the reservoir created. On account of these conditions the design and construction of earth dams often require the very highest type of engineering skill, experience, and judgment. This article, however, will be limited to the nontechnical discussion of the design and construction of small dams and embankments of a type usually required for small farm reservoirs such as can readily be constructed by teams, wagons, and scrapers and without more elaborate construction equipment. The following discussion should be considered only as outlining general methods and not as being applicable to all conditions.

### THE FOUNDATION

The preparation of the foundation for an earth dam is of great importance. The most suitable material on which to place an earth dam is sandy or gravelly clay. However, for a farm reservoir it will generally be necessary to use whatever foundation is available and to take suitable precautions to prepare this foundation so that an economical and safe dam will result. The first thing to

be done is to remove from the entire area to be occupied by the dam all sod, brush, trees, roots, and other perishable matter and all soil to a depth equal to that penetrated by the roots. All this material should be wasted. If pockets of quicksand or clean sand are found in the foundation, these also should be removed, or special precautions taken to care for them under competent engineering advice. If the exposed material is sandy or gravelly clay of substantial depth, the embankment for small dams may be safely built directly upon it, but it should first be scored with a plow to provide a bond between the foundation and the embankment. If solid rock is encountered in the foundation, low concrete cut-off walls should be built parallel to the top of the dam. These cut-off walls should extend at least 12 inches into the solid rock and should rise above the rock surface from 2 to 4 feet according to the height of the dam. Parallel cut-offs should be built at intervals generally not exceeding 20 feet throughout the area of the foundation that consists of solid rock. If the foundation consists of open gravelly or sandy material that would be freely draining, an open cut-off trench should be excavated to the more impervious underlying material and this trench filled with impervious material and made a part of the impervious portion of the main dam. Earth dams should not be built on a shale or slate foundation. If running springs are encountered in the foundation, the site should be abandoned or competent engineering advice secured before proceeding further with the work.

### THE EMBANKMENT

The arrangement of the material in the embankment and the method of placing and compacting it will depend upon the relative quantities and kinds of material and the available moving equipment. If sandy or gravelly clay in abundant quantities is available and the height of the embankment to be built is not over 50 feet, the material may be deposited uniformly over the embankment. The material may be transported and handled with teams and scrapers or dump wagons. The material should be deposited in horizontal layers not over 1 foot thick and the travel over the embankment in placing the material should be so distributed as to secure as thorough and uni-



Irrigation by means of a small flume



form a compacting effect as practicable. If this compacting does not produce a firm and solid embankment at all points, further compacting may be obtained by sprinkling with water and rolling with a steam or horse-drawn roller. Most farm tractors make good rollers for this purpose, or one can be made by placing an axle through several cast-iron car wheels and rigging a tongue to it so that it may be drawn by teams back and forth over the embankment. The corrugating effect of the flanges of the car wheels is especially effective in compacting moist earth. An economical corrugated roller can also be made by filling with concrete a section of corrugated metal culvert pipe about 3 feet in diameter.

It is quite often the case that the amount of sandy or gravelly clay or other available material that will form an impervious embankment is limited and insufficient to build the entire embankment. In such cases it is necessary to use this material to the best advantage and to supplement it with other material that is available in order to make a safe, stable, and water-tight dam. Under such circumstances it is often best to place the best water-tight material in a puddled core in the body of the embankment by sluicing or ponding methods, but it is not recommended that this be done except under skilled engineering supervision. For small embankments satisfactory results, under these circumstances, can usually be obtained by placing the selected water-tight material in the upstream portion of the dam and by constructing the downstream portion of heavy, stable, freely draining material, such as sand, gravel, and stone. Such material should be so distributed that the coarser material is on the downstream slope of the dam, changing gradually to the finer and more claylike material as the impervious material in the upstream portion of the dam is reached. The material should be placed and compacted in a manner similar to that described for homogeneous embankments, but where heavy gravel or rock fragments are used the compacting operations may be omitted. No general rule can be laid down as to the amount of impervious material that it is necessary to use in a dam. For the type of embankment contemplated in this description the thickness of the impervious portion should be not less than one-third to one-half the horizontal thickness of the dam at any elevation.

#### THE DAM'S DIMENSIONS

The proper dimensions for an earth dam depend upon a number of factors. The top width should be sufficient to form a substantial structure and generally should

be wide enough to provide a suitable roadway for crossing from one side of the canyon to the other and for making repairs to maintain the dam and related structures. A top width of 8 feet is suggested as a minimum for small dikes. For dams over 20 feet in maximum height this should be increased up to about 20 feet for dams 50 feet or greater in height. The top of the dam should be sufficiently high above the highest water surface in the reservoir to obviate all possibility of the dam being overtopped even by spray or splashing during high winds. For the very smallest reservoirs the height above high water should not be less than 2 feet and for most ordinary circumstances not less than 5 feet. For reservoirs of any considerable size and for all dams 50 feet or more in height this height should be not less than 8 to 10 feet. The minimum upstream and downstream slopes of the dam are fixed in some States by statutes. The downstream slope should be sufficiently flat to avoid weathering. For the type of dams contemplated in this article this slope should never be steeper than  $1\frac{1}{2}$  horizontal to 1 vertical, even for the smallest dams, and in general should not be steeper than 2 horizontal to 1 vertical. The upstream slope should in general be flatter than the downstream slope and in general should not be steeper than 3 horizontal to 1 vertical. Unless the upstream slope is protected by some suitable pavement such as hand-placed riprap or heavy rock facing it will usually be impracticable to maintain a slope as steep as 3 horizontal to 1 vertical.

#### THE SPILLWAY

Often the most important feature of an earth dam is the spillway. No earth dam should be constructed without ample provision for the safe passage of the maximum flood that can occur with the reservoir full and without encroaching dangerously upon the freeboard of the dam. Spillways for earth dams should in general not be controlled by gates that must be operated by an attendant, but should be automatic. The detail design of spillways is affected by many considerations and each spillway must be adapted to the conditions existing at the site.

#### THE OUTLET WORKS

Every reservoir formed by an earth dam must be provided with suitable outlet works to provide for drawing off the stored water as required and for controlling the discharge from the reservoir. It is most desirable to have the outlet works independent of and apart from the dam, but for the type of earth dam contemplated, it is usually necessary to construct this outlet through its base or at best in a tunnel through one abutment. The main consideration in outlet works for earth dams is to make them safe from danger to the dam structure. The pipe or other conduit laid through the base of an earth dam should be amply strong to withstand cracking or fracture under the heavy load of earth fill placed upon it. The controlling gate should be placed at

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Irrigating a cantaloupe field in the Mesilla Valley, Rio Grande project, New Mex.-Tex.



## TOWN PLANNING A RURAL NEED

**"I**N the United States nearly 20,000,000 people, or about one-fifth of the population, live in villages. These tens of thousands of villages are also the service stations of more than 30,000,000 farming people, for the purposes of business, education, religion, health, and social well-being. Thus the lives of almost half of our population are intimately affected by village conditions. These people, classed as 'rural' by the census, produce practically all of our food supply, send leaders into nearly all walks of life, and are the chief conservators of our national ideals.

"The approaches, arrangement, sanitation, and attractiveness of these villages, upon which a sound and healthy economic and social country life depends, are of vital importance to the half of our population living in the villages or using them throughout a lifetime. Villages should be easy of access; approaches should be direct, durable, and enjoyable. Physical layouts should be based on naturalness, healthfulness, and convenience; housing conditions should be sanitary, convenient, and economical; dwellings should be satisfactory to the eye and set in pleasant surroundings. There should be clean and well-kept lawns, tree-bordered streets, and good architecture. Dump heaps and congested places should give way to open

spaces; and public parks and playgrounds, lake shores, spots of natural beauty, and points of historic interest should be set aside for the use and enjoyment of all. Public buildings should be so located and arranged as to facilitate business efficiency and stimulate civic pride.

"Not all villages can have all these improvements at once, but they can overcome self-satisfaction and plan specifically for the betterment of conditions. The sooner these changes are planned the more easily they will be realized, year by year, even though only one improvement at a time can be made. The plan can be drawn before the village is started, taking into account existing natural conditions and allowing for necessary changes in the future. If the plan is flexible and the goal is always kept in view, the village may easily direct its growth and development, thus avoiding the necessity of making itself over later under great difficulties and at great expense.

"The day of isolation has passed. No longer can villages afford to be ugly and unknown. Modern methods of transportation and communication have opened up the hidden places. Millions of tourists travel thousands of miles annually over improved highways. European villages have long realized the economic value of the tourist traffic and have prepared to take advantage of it. They have found that beauty pays, and discovered

the inefficiency of the commonplace and the efficacy of individuality and physical distinction in towns as well as in people.

"Village planning, whether original or continuous, is not merely a theoretical idea. It is the foresighted application of ordinary business methods in the making of public and private improvements, so that physical development will go hand in hand with social and industrial progress. It is not just a new way of spending money. It is the application of good business principles to the necessary spending of money; the spending of a little to-day that a much greater amount may be saved later. In truth it is real conservation of public property and genuine economy of public funds.

"In the different instances of village planning which follow, some are of definite, initial planning relatively well adhered to in later years; some are a combination of deliberate planning and spontaneous natural development; some are of villages largely replanned at considerable expense and trouble because of undirected early growth; and some are of villages doing one notable thing at a time all directed toward the general future well-being. In all the human element is uppermost. Group action predominates. Social well-being always results whether it is the direct objective or the consequence of primary economic aims."

Farmers' Bulletin No. 1441 gives instances of what has been done in numerous towns in many States, and indicates the importance of such planning and the facility with which valuable results may be attained.

## SMALL EARTH DAMS

(Continued from page 121)

or near the upstream face of the dam to avoid the possibility of introducing water under pressure into the body of the dam. Ample cut-off collars should be provided to prevent percolation of the water along the outside surface of the outlet conduit, and great care should be taken in compacting the earth fill around this conduit. The water should be discharged at the outfall end in such a manner as to avoid all danger therefrom to the downstream toe of the dam.

## ENGINEERING SUPERVISION

On the whole it is believed that there is no structure usually connected with irrigation works that is so subject to varying local conditions and that requires the exercise of more care and mature judgment, to the end that economical and safe construction may be obtained, than earth dams. It is therefore believed that no such dam should be built except under the advice and supervision of a competent and experienced engineer.



A section of the orchard region on the Okanogan project, Washington

## THE TIETON DAM AND RECLAMATION

The Secretary of the Interior dedicated the Tieton Dam on the Yakima project, Washington, on July 2. The following is from an editorial on that date in the Yakima Herald:

The celebration to-day at Rimrock is a historic event of much importance to this valley. The dedication ceremonies to be held at noon mark the completion of one of the largest dams in the world and the largest earth-filled dam. The significant fact about the occasion, however, is that the building of the Tieton Dam anticipates the further development of this fertile valley. The storage waters at Rimrock, together with the normal run-off of the stream, will be sufficient to irrigate 100,000 acres of land in addition to the 348,000 now under irrigation.

We have demonstrated here in this valley that reclamation has not been a failure. The results already obtained justify the opening up of the other four units of the Yakima project to settlers. This project stands out as one of the two most successful projects which have been undertaken by the Government. The gross production on the Yakima project during the last 10 years has amounted to over \$90,650,000, or approximately three-fifths of the total cost to the Federal Government of irrigation construction. All who view the fertile fields, the hundreds of prosperous homes, and the thriving communities of the Yakima valley must realize that they are due to irrigation. And those people who have lived here and have watched the country develop have a clearer vision than outsiders of what the future of this valley will be when the project is finally completed.

## IRRIGATION PROJECTS NEED BETTER METHODS

Taking the projects as a whole the general statement may be made that the farms which are being cultivated under the best methods of crop rotation and properly fertilized are increasing their yields from year to year; whereas the farms which are being handled on a one-crop basis are producing less each year. There is still much room for improvement in farming methods on the majority of the project farms, and there is too wide a difference between the results obtained on the average farm as compared with the best. More attention should be given to building up the soil through proper crop rotation, feeding of livestock, and fertilizing, together with more careful irrigation.

## IRRIGATED LAND SETTLEMENT

**W. G. SWENDSEN**, Commissioner of Reclamation of the State of Idaho, at the recent session of the American Society of Civil Engineers at Salt Lake City, discussed in part as follows a paper presented by A. Griffin of the Canadian Pacific Railway Co. on the subject of land settlement on irrigation projects:

It is no easy task to fabricate a farm from the desert, and to accomplish the feat a person must be equipped either with ample funds or an unlimited supply of physical strength, endurance, courage, and a mental development capable of directing these forces; after this is accomplished, the farm provided and improved, the larger problem, its successful operation, and the enjoyment of life during 365 days each year which must be spent upon it, remains to be solved.

The matter of colonization, after all, is but mere traffic in human beings, and a full realization of the seriousness of the business must be appreciated if success is to be obtained. Success is used here in its broadest sense and implies not only financial gain or prosperity but happiness and contentment as well. Families should not be encouraged to abandon cities or other homes to take up life on the farm until it is definitely known that they are equipped not only financially but, in addition, have general fitness for the new life they are to undertake.

I submit that there is no more interesting or wholesome work than that of farming under irrigation, dealing as it does with the natural elements of sunshine, soil and soil fertility, atmosphere, water, etc., and the bringing together of these in maturing plant life. The most can not be had from such a vocation unless the participant is equipped with at least a fundamental knowledge of agriculture and the processes through which the seeds and plants must pass in their route to maturity. It would, indeed, be a dull and uninteresting life to the engineer or men in other professions if they were obliged to subscribe to mere formula in the building of structures and the doing of other tasks, and thus proceed without a definite knowledge of the conditions and things with which they necessarily deal.

The irrigated farm, offering as it does conditions well adapted to intensive farming, the rotation of crops, and with it the continued building up of soil fertility, and the adjustment of crops to meet market conditions, offers advantages not enjoyed

in agricultural territories where irrigation is not practiced.

As long as the farmer must sit on his plow from day to day with no other thought than that of how nicely the furrow turns over, or how difficult his daily manual tasks are, farming will be a drudgery. But when he is able to analyze the simple, interesting, and beautiful processes through which plant and animal life pass in their route to maturity drudgery will cease and his daily tasks will, in my opinion, become a real pleasure.

It is my belief that if colonization on irrigated areas is to succeed settlers must be selected from persons trained and skilled in the art of irrigation farming and who are adapted by natural inclination and environment to the work which they are undertaking.

## GERMANY CONTINUES HOME COLONIZATION

F. J. Rohr, writing in the International Review of Agricultural Economics, states that "the most recent legislation on home colonization in Germany makes it clear that notwithstanding certain more radical tendencies of the postwar period, the earlier principles directing land settlement and agriculture have been affirmed. The policy of home colonization has been pursued methodically and on practical lines, and nothing has been allowed to modify its purpose, which consists, not in a blind splitting up of the large estates, nor in the creation of farm holdings of some ideal size and type, but in the establishment of the best possible proportion between the various classes of coexistent properties. Notwithstanding all the legislative measures which guarantee the possibility of finding the lands required for settlement, there have been no actual systematic attempts to destroy the striking diversity existing in agricultural conditions in Germany, and there is a general evidence of a desire and tendency to secure an organic and steady development of home colonization. It is all important to maintain the balance between social needs and the material necessity for an increase both in the population and in the food supply."

Regularity in the use of lights, feed, and water for the poultry flock makes for regularity in egg production.

## GRANDVIEW COMMUNITY DAY

THE following account of the seventh annual community day, held by the town of Grandview on the Sunnyside division of the Yakima irrigation project, Washington, was furnished by F. E. Fyfe, president of the board of directors of the Sunnyside Valley irrigation district. This healthy spirit of cooperation between the business men and the farmers might well be emulated by other towns on the projects.

Grandview, one of the live towns on the Sunnyside division, Yakima project, several years ago started an annual celebration at the close of each school year which is known as community day. On these occasions business houses all close their doors for the day, the farmers are invited into town, and the occasion is made one of general get together and offers splendid opportunity for neighbors to get better acquainted.

The seventh annual community day eclipsed all previous days in point of attendance and enjoyment.

The day opened with a parade in which business houses with representative floats, school children on decorated trucks, and several civic organizations participated.

After the parade, which ended at the public school grounds, a picnic dinner was the order of the day, free coffee and lemonade being furnished by the Commercial Club, under whose auspices the day is always given.

The program for the afternoon consisted of drills by several civic organizations, a band concert, sport contests for the boys and girls, a baby show, a baseball game, and "barnyard golf."

It is estimated that 3,500 people attended the community day exercises, most of them being residents of the town and fruit growers and ranchers of the immediate vicinity. There are always, however, a number of people present from the nearby towns of Sunnyside, Mabton, and Prosser.

The Board of Survey and Adjustment, consisting of ex-Gov. Thomas E. Campbell, chairman; Hon. F. M. Goodwin; and Mr. M. M. Moulton, were making a physical inspection of the Sunnyside division at the time and were entertained at the hotel by the chamber of commerce. Talks were made by all three members of the board and everyone enjoyed the meeting.

Grandview was one of the first towns in the Yakima Valley to institute a community day, and so successful have they been that many other towns in the valley have adopted the idea of getting the farmers and business men together and are annually holding some sort of a community celebration.

The Sunnyside division, on which Grandview is located, is one of the best in point of average production per acre of all Government projects, the total crop yield for this division for the year 1924 being \$4,923,821, or an average yield per acre of \$63.02, with an average yield per acre for the past ten years of \$95.46. With good soil and an abundance of water, and populated by a class of people determined to know each other and learn of each other's troubles and aspirations, it is no wonder that here we find reclamation working out to the best advantage.

The cherry crop is being harvested, and there are satisfactory prospects for a good crop of every kind. A spirit of optimism prevails and the valley is rapidly resuming its usual contented and prosperous condition.

Only about 19 per cent of the land area of the United States is at present utilized for producing crops, and it has been estimated that it will be possible to increase this to perhaps 50 per cent of the total area when required.



Potatoes form one of the staple crops on the Minidoka project, Idaho

## THE WATER SUPPLY OF THE PROJECTS

Storage on hand and prospects for natural flow were such that possibility of shortage in irrigation supply was, on July 1, apparent only on the Carlsbad and Okanogan projects as a whole and on some 3,000 acres of Truckee lands on the Newlands project.

Carlsbad project storage was exhausted in April, and the stream flow since that time has been only a fraction of the water ordinarily used. A small flood reached the project the last few days in June. A large part of the project is in cotton which showed the effects of lack of moisture, but can still be expected to produce a crop if moisture is soon supplied. The alfalfa crop had been seriously affected. In most years rains replenish project storage in July.

On the Okanogan project the season for gathering the project water supply has passed, and lands not possessed of very early rights, comprising the larger part of the project, will probably receive a little less than one-half a normal supply. Conditions are, however, materially better than in 1924, and a fair apple crop, the principal project crop, is expected.

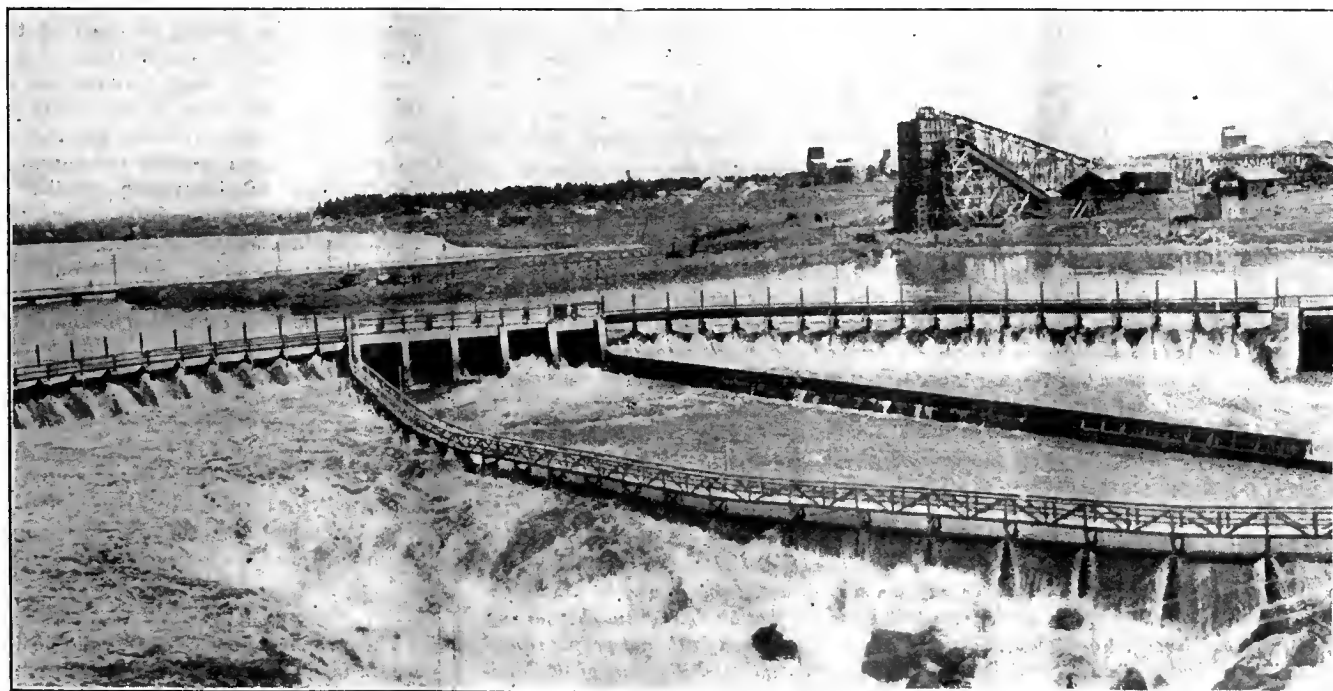
On the Newlands project Lahontan storage is ample to supply the Carson lands by gravity, and an ample supply can be furnished the Swingle Bench lands by pumping over a period about one-half as long as in 1924. Fernley Bench lands in 1924 were badly short from June 1

## STRAWBERRY VALLEY PROJECT NOTES

**D**EVELOPMENT of the dairy industry with appurtenant butter, cheese, and evaporator factories should be fostered among the water users of the project. Water users who have small dairy herds are financially sound and meeting their obligations. The dairy business is especially necessary in filling out the cycle of farming operations and building up the land for greater production. It provides a monthly income during those periods of the year when the majority of farmers are without remunerative work. Many of the water users are closely scrutinizing the accomplishments of their neighbors who have dairy herds, and it is believed that many are realizing the necessity of having an all-the-year-round industry and income. There has been a slight increase during the past year in the number of dairy cattle, and it is expected that gradually the industry will grow on the project. In fact, general information of various kinds has been furnished to one large condensed-milk manufacturing company, with the view of getting them to establish a factory on the project. This company provides its own system of financing the farmers in the purchase of dairy stock on reasonable terms.

to October 1, but this year are not expected to be short much before August 1.

A large part of the project area is extremely fertile and especially adapted to the growing of such truck as peas, beans, tomatoes, cabbage, cauliflower, head lettuce, celery, and other table foods. The raising of these crops is, however, more or less new to the majority of the project water users, and no organization at present exists to handle properly and ship this class of produce to outside markets. A large packing company has opened a canning factory near Spanish Fork. The establishment of this industry on the project and the gradual education of the water users to the growing of crops for canning purposes will be of great assistance in increasing the average annual gross acre income of those water users whose lands are adaptable. The benefits accruing to the project from the introduction of such industries are hard to estimate. New and more economical methods of irrigation, peculiar to the various crops, are introduced, which in many cases result in a large saving of irrigation water and the abandonment of many haphazard irrigation methods which in the past have resulted in wasting large amounts of water. These factories provide field men who examine the crops and teach better methods of irrigation and culture.



Early stages of construction on the American Falls dam. View from east end of railroad bridge



## PUMPS INSURE AGAINST DROUGHT

THE shareholders of the Salt River Valley Water Users' Association voted on April 7 to develop additional pump water in case the anticipated drought continues. This year the project will pump close to 300,000 acre-feet of water, and there will be available in addition to the normal flow in excess of 2.6 acre-feet of water for every acre of the project. For some lands this means a shortage even with considerable effort to conserve water, but in general there will not be any serious curtailment of production this year.

It is expected that the new pump development will be completed by August 1, and that the project will be able to pump nearly 400,000 acre-feet of water next year in case the anticipated drought continues. Assuming even the driest years of record for the next two years, there will still be available with this new development 2,000,000 acre-feet of water for the seasons of 1925 and 1926. In 1926, assuming a continuation of drought condi-

tions, this will mean 2.7 acre-feet per acre delivered to the farmers in addition to the normal flow. For full production this will mean that every effort must be made by the farmers to conserve water, and for some sections will necessitate some curtailment in acreage or production, but in general the project as a whole will not be affected.

It is believed, therefore, that with the completion of the new pump project a serious shortage of water, which would affect intrinsic values, will have been permanently prevented.

Under the power contract and interchange of power agreements, there will be ample power for all the pump projects to which power is served. The estimate on the power system for next year, even assuming that the drought continues, is 110,000,000 kw. h., approximately 60,000,000 of which will be hydroelectric and the balance steam. This is on the basis of the driest year of record next year.

The voting of the pump assessment by a 4 to 1 vote has been a great relief to every thinking person in the Salt River Valley, as it will mean the addition of one extra irrigation this year, and nearly a full supply next season, even under the worst conditions.

## FARMERS SHOW PROFITS ON LAST YEAR'S CROPS

The average cost last year of producing a bushel of wheat was \$1.22 compared with an average sale value of \$1.43 a bushel.

The average cost of the corn crop was 82 cents a bushel compared with a sale value of \$1.10 a bushel.

The average cost of oats was 50 cents a bushel compared with a sale value of 57 cents a bushel.

Cotton cost an average of 18 cents a pound and had an average sale price of 23 cents a pound.

Average production costs of potatoes were below the average selling price.

Costs include charges for labor of the farmer and his family and a charge for the use of the land on a cash rental basis, so that where the cost just equaled the price received the farmer was paid for his time and his investment.

## REPAYMENT POLICY OUTLINED

THE general policy has been adopted by the bureau and ratified by the Department that charges due must be paid in every case in which the water users are financially able to make payment. The various relief acts and the adjustment act of 1924 are designed to provide only such relief as may be needed. Subsection F of the adjustment act provides for funding of delinquent charges when adjustment contracts are made, but as a prerequisite to the execution of such contracts the Secretary of the Interior, in his discretion, may require compliance with any reasonable conditions, one of which will no doubt be that operation and maintenance charges for 1924 and 1925 be paid if the financial ability of the water user permits. The same principle is applicable to the payment of construction charges, but naturally preference will be given to the payment of operation and maintenance charges where the financial condition of applicant will not permit payment of both.

Construction and operation and maintenance charges accruing prior to 1924 and delinquent when adjustment contracts are made will be funded as the law provides, but this does not mean that pending possible execution of such contracts water users may deliberately refuse to make any payments, even when financially able to do so merely for the purpose of having charges accumulate to be funded under subsection L of the act mentioned. The law makes it optional with the Secretary of the Interior to amend outstanding contracts, and in this connection he may impose such reasonable conditions as he may find the circumstances justify as a prerequisite to the amendment of present contracts.

This policy is one of general application, and there is no disposition to prejudge the necessity for relief or the extent to which relief will be granted. Careful and sympathetic consideration will be given to all facts presented and recommendations made by the Board of Survey and Adjustments and other data submitted bearing upon the financial and economic situation, and such action will be taken and recommendation made to Congress as the conditions so developed seem to warrant. Good faith demands that each landowner make payments when able to do so and he should not be deterred from this course by the possibility or hope that all delinquent charges will be funded. Such action would evidence not only lack of good faith and proper regard for contractual obligations, but may lead to disappointment on the part of the landowners.

## DESCRIPTIVE TABLETS SUGGESTED FOR DAMS

It has been suggested that a suitable metal tablet be placed on each of the large storage and diversion dams of the bureau containing such information as the capacity and area of the reservoir; height, crest length, volume, and cost of the structure; and possibly the names of the principal administrative officials of the Department of the Interior and the bureau during the time of construction.

The cost of such tablets would be relatively small, they would serve a useful purpose in furnishing information readily to tourists, and doubtless the various civic and other organizations on the projects would be glad, as a matter of pride, to defray the cost of the tablets.

The superintendents of the Boise and Shoshone projects have already been requested to furnish drawings of such proposed tablets for the Arrowrock and Shoshone Dams, respectively.

The primary horsepower available for use on farms is greater than that used in mining and manufacturing, and is second only to that required for railroads.



## POINTS TO CONSIDER IN DAIRY HERD

**G**OOD individuals of whatever breed is selected should have first consideration by the man about to launch himself into the dairy business. As between breeds, there are three points that should be considered: (1) The breed that predominates in the locality where the new herd is to be located; (2) personal preference; and (3) market requirements for the product.

There are a number of advantages to a dairyman in having the same breed as his neighbors. A dairyman just starting with purebreds may feel that since his neighbors have one breed of cattle he should get another breed so as to have a monopoly in the business of selling breeding stock. There is no question about the monopoly, but there would be no business to monopolize. It is difficult for an isolated small breeder to dispose of his stock to advantage, while if there are

many breeders with the same breed buyers are attracted to the locality because of the better chance to get the desired animals from one or more of the several breeders. Other advantages in having the same breed as the neighbors are the opportunity to exchange bulls or to own good bulls cooperatively; to take advantage of breed sales of surplus stock; and lastly, the advantage of bringing the community together in other endeavors which usually result where there is but one breed.

Because a man will usually do best with a breed that he likes, it is well to give this personal preference the right of way when there is no other breed already established, providing, however, that just as high quality animals are available in the preferred breed as in some other breed.

Market requirements for the product should not be overemphasized, for the

reason that these requirements may fluctuate from one year to another, and, obviously, the dairyman can not change breeds with every change of market requirements.

In summing up the matter of which breed to select this point should be kept in mind: there are good cows and poor cows in all breeds, and, other things being equal, the breeder or dairyman who gets good individuals to begin with will have a good chance for success, no matter what breed he selects.

The several breeds recognized as dairy breeds in the United States are the Ayrshire, Brown Swiss, Dutch Belted, Guernsey, Holstein-Friesian, and Jersey. Although much alike in what is known as general dairy conformation, these breeds differ to some extent in certain characteristics. What these characteristics are, the factors to consider in selecting a breed, and the history and origin and development of the breeds, are questions of interest to both the beginner and the established breeder of dairy cattle. These topics are discussed in a new bulletin issued as Farmers' Bulletin 1443.

## THE SILO HELPS THE DAIRY HERD

**T**HE silo makes it both possible and profitable to keep more livestock on the farm.

It provides a convenient and cheap storeroom for roughage, preserving it in a succulent and palatable form.

It combines more good qualities and greater profits on the investment than any other building on the farm.

Corn and sunflower silage, fed in combination with clover, alfalfa, or vetch hay, provides a forage ration succulent, palatable, and properly balanced.

It cheapens the cost of milk or meat, prevents waste in feeding, and saves labor.

Any dairyman who can break even without a silo can easily make 25 per cent profit by the building and proper filling of a silo.

Crops can be put in the silo during weather that would make it impossible to cure hay or other fodder in any other way.

As a business proposition any dairyman with a half dozen or more cows can afford to borrow money to build a silo. It would pay for itself in a short time.

The important factors of a good silo are: It should rest on a solid foundation, should be absolutely air-tight, smooth inside, and the height should be three times the diameter.

Thirty pounds of corn silage and 15 pounds of alfalfa hay make a well-

balanced daily ration for a 1,000-pound cow. With this forage ration, a cow that is giving less than 20 pounds of milk a day can not profitably use a grain ration.

For a cow giving over 20 pounds of milk a day the addition of 1 pound of mixed

grain for each 5 pounds of milk will usually pay a profit.

An analysis of numerous reports of cow-testing associations indicates that the cows fed a silage ration average about 25 per cent greater production than those that are fed dry forage.—*Building and maintaining a dairy herd, U. P. System.*

## FARMS SHOW IMPROVED FINANCIAL RETURNS

*An average cash balance of \$1,024, the margin of cash receipts over cash expenses, was returned to owner-operators in 1924 on 15,103 farms surveyed by the Department of Agriculture. In addition to this margin these farms increased inventories of crops, livestock, machinery, and supplies \$181, making an average return of \$1,205 for the use of \$17,260 of capital and the labor of the farmer and his family. These farms also produced food and fuel consumed on the farm estimated to be worth \$266 on the average. A similar survey in 1923 on 16,183 owner-operated farms averaged a cash balance of only \$890, increased inventory of only \$130, and produced food and fuel worth \$265 on capital amounting to \$17,490.*

## SAVE YOUNG LIVESTOCK AND INCREASE INCOME

Cutting down the high and costly death rate among infant livestock is one of the farm problems for which the farmer must apply the solution himself. The causes of early deaths in livestock fall into three general classes:

1. Conditions little influenced by treatment: Malformation, extreme feebleness or extreme prematurity, certain accidents during birth.

2. Conditions capable of considerable reduction, chiefly through proper hygiene, sanitary isolation, and medical treatment: Tuberculosis, acute respiratory diseases, certain acute contagious diseases, some forms of animal parasitism.

3. Conditions capable of a very great reduction through proper feeding, care, and sanitation: Acute gastrointestinal diseases, goiter troubles, prematurity (if not extreme), many forms of animal parasitism.



Boise project strawberries add materially to the farmers' income

## THE PUNJAB CANAL COLONIES

THE April-June issue of the International Review of Agricultural Economics contains an interesting article on the subject of "Indian irrigation and the Punjab Canal colonies," by D. N. Bannerjee.

Referring to the watershed between the Jhelum and the Sutlej, the article states that "the Lower Chenab Canal has converted this wilderness into a garden. Before the process of colonization began in 1892, cultivation was confined to the fringes of the rivers. To-day, the value of the crops grown on the lands irrigated by the Chenab Canal varies between 16,000,000 and 20,000,000 pounds sterling. This canal carries the discharge of 10,700 cubic feet a second, which it distributes with the help of 2,243 miles of distributaries drawn from 427 miles of the main canal. This canal has proved most remunerative to the Government; the capital account stands at 3,500,000 pounds, on which it yields an annual return of 47 per cent. Its revenue account showed up to January, 1924, an accumulated profit of 16,500,000 pounds after all interest charges and working expenses had been met."

The fundamental objects of the schemes that have been put in operation in the canal colonies are summarized, in part, as follows:

1. The aim is to plant the nucleus of a village community, particularly in those areas where the population has not had sufficient skill and capacity for work to develop naturally into an agricultural community. In order to maintain cohesion among the cultivators, efforts have been made to settle members of the same community in certain villages. The ground is thus prepared for cooperation between the richer and poorer elements among the settlers. The weaker ones

*"I sincerely believe in the principle of cooperative marketing as an important means of placing our agriculture on a more profitable basis. From the viewpoint of the farmer the cooperative is not a mere business organization in which he invests a small part of his capital. It is an organization into which he places his entire year's work and that of his family. His welfare and that of his family are wrapped up in the success of the association. Let us have a more thorough understanding of the functions and responsibilities of the co-operatives and I predict for them a large measure of success."*—Secretary of Agriculture Jardine.

can, when occasion arises, borrow seed, tilling implements, and even money from the better off. This experiment has, on the whole, worked quite satisfactorily.

2. In the selection of candidates it has always been the aim to encourage those who are solvent at the beginning of their careers and who are equipped with sufficient resources to grapple with the initial difficulties attendant on settling down in new surroundings.

Pointing out the vast difference between ordinary agricultural development and development under irrigation, the article refers to the following statement by Sir John Maynard: "What is wrong in these matters is that the department concerned has not realized the distinction between the slow development of the normal district and the complete revolution which takes place when irrigation is introduced in a desert. For the former the ordinary principles of gradual addition to existing facilities are appropriate. For the latter the question is one of creating a new machinery for an almost entirely new population, and substantial special appropriations are needed."

In conclusion the article states that the greatest need of the cultivators is a thorough comprehension of how agriculture may be made profitable and the methods whereby this end may be achieved, and that the average cultivator needs, above all, training in organization.

## USE OF POWER ON AMERICAN FARMS

The American farmer ranks next to the railroads and leads both the manufacturing and mining industries in the use of power. Approximately 60 per cent of the power utilized on farms is animal power. Tractors account for nearly 17 per cent, motor trucks about 4 per cent, stationary engines 12.5 per cent, windmills a little more than 1 per cent, and electrical installations 5.5 per cent. The use of this power, together with labor-saving machinery, has greatly benefited the American farmer. The average farm worker now cares for approximately three times as many acres of crops as did the worker of 75 years ago.

The cost of animal power per horsepower-hour varies considerably in different sections of the country, and this variation has an important bearing on the question of the advisability of substituting mechanical power for animal power.

Wheat is about equal to corn for feeding swine. Oats, if ground and hulls sifted out, is one of the best grain feeds for little pigs.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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## Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho.....	F. A. Banks <sup>1</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
North Platte, Guernsey Dam	Guernsey, Wyo.....	F. F. Smith <sup>1</sup> .....	Chas. Klingman.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>1</sup> ..... Ralph Lowry <sup>2</sup> .	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.

<sup>1</sup> Project operated by Salt River Valley Water Users' Association

<sup>2</sup> General Superintendent and Chief Engineer.  
<sup>3</sup> Resident Engineer.

<sup>4</sup> Construction Engineer

The NEW RECLAMATION ERA is issued every month by the Bureau of Reclamation of the Department of the Interior, Washington, D. C. It is printed by the Government Printing Office, Washington, D. C.

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*THE efficient operation of a farm implies the most efficient use of land, labor, and capital. These factors must be combined in such a way as to reduce the cost of production and yield the farmer the maximum net returns for his efforts. This implies the proper size of farm unit, the correct choice of crops, the proper emphasis on the individual crops, the employment of the right size and type of machinery, the feeding of balanced rations, and the like. Perhaps also there are acres so low in fertility that they can not be profitably farmed at present prices. In short, the efficient farmer will strive to find the combination of factors which will result in the lowest production costs and the highest net profits.*

*THE SECRETARY OF AGRICULTURE.*

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# RECLAMATION ERA

VOL. 16

SEPTEMBER, 1925

NO. 9



THE GIANT CACTUS OF THE ARIZONA DESERT



*I AM NOT in favor of waiting until scarcity of food has been demonstrated to begin preparations for its production that will require 25 years to complete. But it is imperative that we complete and settle those projects that are unfinished on some plan that will insure permanency and secure ownership in those living on them.*

*In a conversation with President Coolidge on reclamation, he said: "Lay your plans for 20 years in advance. The population of this country is increasing very rapidly. The fertility of the older farms is being exhausted. We will need that new country to furnish food and produce wealth for the people of the United States."*

*HUBERT WORK,  
Secretary of the Interior.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

SEPTEMBER, 1925

No. 9

## SECRETARY AND COMMISSIONER GET FIRST-HAND DATA

*Extended visit affords personal knowledge of economic conditions on projects where works are being built to reclaim new areas and where appropriations have been made for beginning such works*

IN order that Secretary Work and Commissioner Mead might have a first-hand personal knowledge of economic conditions on projects where works are being built to reclaim new areas and where appropriations have been made for inaugurating such works, a visit lasting one month and extending through six arid States was inaugurated by a conference with State officials and Members of Congress at Cheyenne on June 21.

Addresses were made at Cheyenne by the Secretary and the commissioner<sup>1</sup> explaining the purposes of the inspections to be made and outlining the problems of reclamation in solving which it is believed the State and Federal Governments should cooperate. With the Secretary and commissioner were W. J. Donald, of the Interior Department; W. J. Carroll; Dr. Ernest Clark and wife; Harry J. Brown, of Washington, representing western newspapers; and Malcolm Cutting, of St. Paul, representing the Country Gentleman. Several State officers and the Wyoming congressional delegation and officials of the Burlington Railroad were members of the party in the inspection of Riverton and Shoshone projects. In Montana, Governor Erickson joined in the inspection of the Sun River project; representatives of the Great Northern and Northern Pacific Railroads accompanied the party through Montana and Washington. Senator Jones, of Washington, took part in the inspection of irrigated areas and in the conferences with settlers in Washington.

In Oregon Senators McNary and Stanford and Congressman Sinnott and Governor Pierce participated in the conferences at Portland and all except Senator McNary took part in the inspection of the Baker, Vale, and Owyhee projects. In Idaho conferences were had with Governor Moore and State officers and all the members of the congressional delegation; Senator Gooding and Con-

gressmen French and Smith participated in the inspection of areas for which works are being built or plans being made for construction. There were frequent meetings with water users and a number of important conferences with chambers of commerce and development organizations.

### RIVERTON PROJECT, WYO.

The Riverton project, in the Big Horn Basin in Wyoming, was the first project inspected. It is to irrigate 100,000 acres at a cost of about \$100 an acre. The diversion dam in Wind River and about 16.5 miles of main canal have been completed at a total cost to date of \$2,800,000. The completed section of the main canal can supply water to 10,000 acres of privately owned land and 5,000 acres of public land. Prior to leaving Washington the question had arisen as to how soon an attempt at settlement should be made.

If all the unexpended appropriation for 1926 is used to build laterals water can be supplied to irrigators next year. If the appropriation is largely spent on continuing construction of the main canal land-

owners under the project would have to wait at least another year before beginning cultivation. It was decided, therefore, to use the appropriation to complete the laterals and to notify all owners of land under those laterals that they could have water for irrigation on a generous water-rental basis on a three-year contract beginning next spring. If these owners respond favorably money for an extension to new areas will be asked for. If not a halt will be called on main canal construction until the lands now supplied with water are irrigated.

### WILLWOOD DIVISION OF THE SHOSHONE PROJECT, WYOMING

The next area inspected was at Willwood, where the main canal and laterals to irrigate 15,000 acres are nearing completion. This land is all public. The average construction cost will be about \$100 an acre. Ten thousand acres of this area have gentle uniform slopes and are well adapted to intense culture. Settlement at the outset will be restricted to this area. Conferences with railway officials interested in this development and with State officers of Wyoming revealed grave doubts as to whether this area can be settled and farms developed under the present depressed condition of agriculture. More aid and advice in farm development and in working out a cultivation program are regarded as needed to make these farms attractive to settlers. No applications for farms here have been received.

It was decided to postpone all efforts at settlement until prospects are more encouraging.

### SUN RIVER PROJECT, MONTANA

The Greenfields division of the Sun River project is located west of Great Falls, Mont. Works have been built and water is now supplied to farms

### IT DEPENDS ON WHO DOES THE FIGURING

*In the course of one of his addresses on his recent trip to the projects the Secretary of the Interior referred to the fact that "figures never lie, but liars figure," and illustrated his point by the following story:*

*"As one of your citizens said to me here yesterday, he quoted a farmer as saying: 'I know that I settled on this farm many years ago and I know that I raised my family and I know that I schooled them and I know that I am not in debt, but my son came home from the agricultural college recently, and he, with a pencil and piece of paper, showed me where I was broke.'"*

<sup>1</sup> See NEW RECLAMATION ERA, July, pp. 97 and 102.

## ECONOMIC ASPECTS OF PROPOSED PROJECTS ANALYZED

*New legislation or modification of present legislation essential in order to put into effect carefully considered plans for aided and directed settlement to insure success*

*(Continued from page 129)*

scattered throughout an area of 40,000 acres. Of this, 13,000 acres were irrigated in 1924. The plans for this project contemplate building a reservoir to hold 195,000 acre-feet of water and for extending the distributing canals to irrigate 100,000 acres.

Thus far no construction payments have been asked for on this division. Water has been supplied on a rental basis. One reason is the uncertain water supply which will continue until a reservoir to hold back flood water is built. This will greatly improve conditions for those prepared to use more water, but it will add largely to yearly payments by irrigators. Settlers on the project are not now prepared for this as they are heavily in debt and have been unable to fully improve or equip their farms. There is little prospect of betterment unless they can have their present debts refunded and reduce their interest obligations. To properly cultivate the 40,000 acres now supplied with water would require about 250 more farmers, and if the whole 100,000 acres are brought under cultivation it will need about 1,000 additional farmers.

One year ago in considering what should be done with this project, the commissioner was influenced by the need of settlers for a large and more reliable water supply to recommend the construction of a reservoir at Beaver Creek, but he coupled with that recommendation a statement that with it should go legislation which would insure a definite crop program and financial aid to settlers who would lack capital to fully improve and equip their farms. Congress accepted this view and provided that the State should secure settlers and give them financial aid in farm development. It was not required that this aid be extended now, but the bureau believed that before construction contracts are made some assurance should be had from the State that it was favorable to this legislation and would aid in carrying it out when the time arrived. A conference was arranged with Governor Erickson, but he did not feel warranted in either assuming any definite obligation now, or in promising that he would recommend legislation authorizing such aid by the Legislature of Montana at its next session. In the absence of any such assurance, it was decided to postpone for the present a decision on construction. Meantime negotiations are being carried on with water users regarding the contract they

must sign for the repayment of project costs.

To complete these storage works and extend the canals would mean an additional expenditure of about \$5,000,000 and a water-right payment on good land of about \$100 an acre. This is larger than the water-right payments on either Milk River, Lower Yellowstone, or Huntley projects in Montana where settlers are finding it difficult to meet payments and in some instances are not doing so.

### THE KITTITAS DIVISION OF THE YAKIMA PROJECT, WASHINGTON

From Montana the party went to the Kittitas division of the Yakima project in Washington. This division has a total area of 70,000 acres, of which about 60,000 acres are in private ownership. The remainder is owned by the Federal Government and the State of Washington. The total construction cost, including the proportionate share of the cost of the Tieton Reservoir, will be about \$11,000,000, or \$161 an acre. In recommending an appropriation for this construction, the bureau coupled it with a statement that aid in settlement and farm development should be provided. Provision for this aid was incorporated in the appropriation for the project. It requires the State of Washington to subdivide and settle the land, and furnish financial aid in the development of farms. In a conference with Governor Hartley, of Washington, he explained that he did not feel warranted in entering into such an obligation. The department, therefore, has no choice but to postpone construction until there has been further legislation. Investigations into the things which will affect the feasibility of the project are being continued, a soil survey is being made, and the lands are being divided into six classes based on productive values. Arrangements have been made for an appraisal of the present value of the land, which would be a basis of its sale to settlers when subdivision takes place. The expenses of this are being paid out of the appropriation for secondary projects.

### UMATILLA PROJECT, OREGON

At a conference in Portland the Stanfield and Westland irrigation districts, which are purchasers under Warren Act contracts of water rights in the McKay Reservoir, which is a part of the Umatilla project, asked that the Government purchase the irrigation works of those districts

and provide for their enlargement and reconstruction. No assurance was given that this will be done. It was stated that the financial condition of these districts is such that they will be unable to make these improvements without Federal aid or to pay for the stored water unless the Government finances the enlargement of their canals.

A report on the above-mentioned Umatilla project shows the importance of careful soil surveys and appraisals of land values before any new projects are undertaken. From this report the following statements are copied:

On the Umatilla project there are 4,473 acres of class 6 lands in a compact area. This area represents 202 ownerships. Eighty-two units are still in their wild state. One hundred and twenty of the units have been settled at one time or another. Ten of the original settlers remain. There are 32 owners living on the land at present, most of whom are working out for their living. The total cultivation on the 4,473 acres is approximately 500 acres.

Water is delivered to these settlers every 9 to 10 days. Seven acre-feet minimum is supplied to these lands at \$1.65 per year and 75 cents per acre-foot for additional water except for newly sown crops, when 25 cents per acre-foot is charged. The average amount of water delivered to these farms in 1923 was 9½ acre-feet an acre. One farmer this year used 56 acre-feet on 20 acres for the month of May.

The 32 resident settlers are scattered, which necessitates the operation of all the ditches and pipe lines traversing the area. If all of the class 6 lands were excluded from the irrigable area and water-right applications canceled it would eliminate operating the following systems: Z, ME, RI, and RIJ, and possibly the MB. To do this would require canceling or otherwise removing the water-right applications on perhaps six tracts now classed as No. 3.

These lands have taken a frightful toll from those who have attempted to cultivate them. On section 34, served by the Z line, eight homesteaders settled, built houses, and cleared the land. Only one remains, and he works out as a carpenter. Recently an old man and his wife traded a Montana stock farm for one of these tracts. The owner of the tract obtained it by foreclosure of mortgage, and this was his way to "unload."

Most of the lands are delinquent in their charges from 1921 to date in sums from \$15 to \$800. One man owes \$2,067 water charges on 70 acres. There are three tracts (70 acres) that have paid up water rights. Of the owners residing, 19 are paid up to date. A few of the nonresidents also are paid up.

Future trafficking in these lands should be stopped. They are uneconomic and can not return the cost of the irrigation works.

**BAKER PROJECT, OREGON**

On July 9 an inspection was made of the Baker project, for which \$500,000 was appropriated by the last Congress. This project has an area of about 27,000 acres. There is a question as to its feasibility because of the steep and irregular slopes to be irrigated. For several years Congress has appropriated money for beginning construction, but doubt as to the economic results has caused the department to postpone construction. An economic report prepared in 1924 states the project is feasible if provision is made for giving agricultural advice and direction to settlers and extending financial aid in the improvement and equipment of their farms. Nothing has been done in the way of legislation, State or Federal, for giving this aid. Construction is being delayed until further investigations are made as to feasibility under the law as it now stands.

**VALE PROJECT, OREGON**

The Vale project, authorized by the last Congress, has some unusual features. Instead of building storage works to provide water that could not be supplied from a direct flow of the stream, the water supply is to be purchased from the Warm Springs irrigation district which has surplus water in its reservoir. The price to be paid by the bureau for this water has been fixed at \$8 an acre, payments to be made as appropriations are provided by Congress. The lands to be irrigated lie above the Warm Springs irrigation district. Because of their elevation above the stream a long canal, passing through difficult country, has to be built. The construction of this canal will be costly and the estimated average cost of water rights is \$126.50 an acre. There is considerable variation in the quality of the land, and the price of water rights will vary with this, the aim being to pay on the productive value of water. The land is now being classified as a basis for fixing these charges.

The appropriation for this project has a provision similar to those for Sun River and Kittitas. The State is required to become responsible for the settlement of the land and the development of farms. The bureau is prepared to begin the construction of this reservoir whenever assured by the State of Oregon that the State will do this. The governor accompanied the party in its inspection of the project, but was not in a position to announce what he thought the State should do. Of the 28,000 acres in this project 24,000 acres are privately owned. Thirty-eight per cent of the land of the project is owned by two companies. Before beginning construction all owners of surplus land will be required to fix a minimum

price satisfactory to the department, at which this land will be sold to settlers.

**THE OWYHEE PROJECT, OREGON-IDAHO**

Adjoining the Vale project in Oregon and extending over the boundary into Idaho is the Owyhee project. The water for this project will be taken from the river of that name. A reservoir to hold 570,000 acre-feet of water is to be built and 12 miles of tunnels will be required. Of the 139,000 acres included in this project only 18,000 acres are public land. The remainder belongs to the two States and private owners; 58,600 acres are included in private projects which now obtain water by pumping from Snake River or have an inadequate gravity supply from the Owyhee. These private projects will buy water from the reservoir under Warren Act contracts.

The 139,000 acres of the project are nearly all of superior character, both as to evenness of slope and fertility of soil. It will be necessary to reach an agreement with the owners of large holdings of

which there are a few regarding the price at which surplus land will be sold to settlers. Negotiations to fix this are in progress.

The estimated cost of this project is \$18,000,000 in round numbers. Of this \$12,000,000 will have to be spent before there is any return and it will require about four years to excavate the tunnels and build the storage dam.

Owing to the fact that so much of the land is privately owned, care is being exercised to have all agreements that affect water payments and sales of surplus land properly prepared and clearly understood.

The average acre cost of water rights on the new land of the project proper is \$139 an acre. The cost of water sold under Warren Act contracts will vary from \$25 to \$125 an acre-foot, the cheaper cost being for water turned from the reservoir into the river and the higher one when it has to be delivered at the end of long canal lines.

(To be continued)

**DRAINAGE PAYMENT PLAN URGED**

**T**HE board of directors of one of the water users' associations on the Boise project recently adopted the following resolutions providing for the appointment of a committee to propose a plan to bring about the payment of all drainage charges now due:

"Whereas the settlers and landowners on the Boise project have been ill advised in regard to the payment of the drainage charges and by following inconsiderate and bad advice, numerous ones have become involved with the Government in controversies over the collection of these charges due prior to 1924, and all have been prejudiced to a greater or less extent in their efforts and rights to receive relief in having delinquent payments of construction and operation charges added to the future undue charges and payment of the same provided for by the 5 per cent method prescribed by the relief act; and

"Whereas it is the belief of this board that the requirement of this payment on the part of the Secretary of the Interior and Commissioner of Reclamation is for the purpose of convincing Members of Congress and the country generally of the good faith of the settlers on this and other irrigation projects and is in line with the policy adopted by the Secretary of the Interior and announced by the President in the publication of the Secretary's letter and report of December 11, 1924, immediately after the passage of the relief act; and

"Whereas it is the belief of this board that the settlers and landowners on the Boise project are very generally heartily in support of the Secretary in their desire to assist in carrying out this policy and believe it to be perfectly sound and the most feasible for reviving the reclamation act and making of it the success for which it was intended and is entitled: Now, therefore, be it

"Resolved, That the President of the Board of Directors of the Payette-Boise Water Users' Association be authorized and directed to appoint a committee with authority and direction to make thorough investigation and propose and report a plan to this board by which the payment of all drainage charges now due both prior and subsequent to 1923 may be secured without permitting the Secretary of the Interior or Commissioner of Reclamation being further bothered or concerned about these charges; and be it further

"Resolved, That the committee be authorized and directed to frame an appropriate expression of gratitude and thanks to the Secretary of the Interior and the Commissioner of Reclamation for their consideration in handling this matter."

## CONGRESSMAN CRAMTON URGES NEED FOR COOPERATION

*Brief extracts from masterly and convincing speech at Great Falls, Mont., July 26, 1925, by Hon. Louis C. Cramton, Chairman of the Subcommittee of the Committee on Appropriations of the House of Representatives, in charge of the Interior Department bill*

**W**E visited Sun River to-day and yesterday. My feeling is that the future of irrigation in Montana needs to be sold only to the people of Montana. This future is in the hands of the people living on the projects, the people who will in future come on to the projects and the business interests of the State. You do not have to beg for money from the Treasury of the United States. You do not need it. All this State needs is confidence in its own future and willingness to do business in a businesslike way. I come from a beet-sugar district. The building of the two sugar-beet factories we have seen this week is a guaranty of what business men think coming into the State, putting their money in as a business proposition, expecting to do business in Montana and have their money returned to them with profit, and it shows what faith they have in the future of the State.

We have gone over the Sun River project. We have met with the people interested in the project. We have learned of the desire to have the dam constructed to make possible the beet sugar problem. The appropriation was for \$611,000, of which \$500,000 was for construction, providing no money could be used until a district was created. We would rather do business with a district than with thousands of water users. That district I am advised has been

organized and is ready to contract. It is true we also provided:

That no part of the sum hereby appropriated shall be expended for the construction of new canals or for the extension of the present canal system for the irrigation of lands outside of the 40,000 acres for the irrigation of which a canal system is now provided, until a contract or contracts shall have been executed between the United States and the State of Montana, whereby the State shall assume the duty and responsibility of promoting the development and settlement of the project after completion, securing, selecting, and financing of settlers to enable the purchase of the required livestock, equipment, and supplies and the improvement of the lands to render them habitable and productive. The State shall provide the funds necessary for this purpose and shall conduct operations in a manner satisfactory to the Secretary.

That provision was put in. But that provision has nothing to do with the construction of the dam, nothing to do with the existing project, and was only intended to apply to the additional forty or sixty thousand acres hereafter to be developed.

I realize that I have now an opportunity to talk to some of the influential men of the State, some of the men that I hope can see their way clear to cooperate a hundred per cent with us in working for the welfare of your State and the success of irrigation.

The other day I saw a man on a project in your State where there were 15,000 acres in the division and only 4,000 under irrigation, and most of that producing wild hay. Here the Government is spending thousands more than it gets back, even for operation and maintenance, on lands on which you can grow sugar beets, with a factory to use them. What was he paying for 1,200 acres—\$150, or 10 cents an acre. Do you expect that we in the days of this economy program will stand for that kind of business? It isn't business. Montana can not hope to be built up on public extravagance. I became a convert to irrigation not as a local matter but as a national matter. This thing has been prominent in my mind—to find the policy that will be the greatest safeguard for the future of democracy, and looking to the future I hold there is nothing that is so great a guaranty against the destructive spirit of communism and socialism as having men live on the land that they own and till that soil. They are safeguards of our kind of institutions, and every place you have 80 acres of irrigated land and a man living on it who owns it he is a sheet anchor for our institutions. The more I have seen the more I have been convinced the greatest enemies to reclamation in this country are those who want to make a political pork barrel of it, political Santa Clauses taking something off a tree to make it easy for some one to get something for nothing, not a matter of Federal cooperation, but a matter of Federal Government spreading its largess over the country.

Doctor Mead is a man in whom I have very great confidence, and referring to project after project of these new ones I asked him "Is that project feasible?" He said "Not under the existing law, it is not." Then we proceeded to surround them with safeguards to make them successful. Thus we sought to insure the success of these projects—not only protecting the Treasury of the United States but attempting to protect the States where the projects are located through securing the success of these projects in the future. What did we try to do? We tried to provide for an irrigation district so we could do business with an organization instead of a mass of men. Then we sought to protect the settler against exploitation by the speculator, because if we extend this policy to private land and use public money to construct works for



Looking up the main canal on the Lower Yellowstone project, Montana-North Dakota



private lands, we increase the value of those private lands and we create a situation of which the owner is bound to make most use. So they sell the land and skim off the cream of what the Government is doing and the settler doesn't get the benefit of it.

I asked Doctor Mead as to one of these projects, "How long will it be before the Government gets its money back?" "One hundred and thirty-eight years," he answered, "without interest, and then, unless you protect the settler against exploitation, the speculator will get the cream." Then we provided for State local cooperation in financing the settler. On the Sun River we felt when they were bringing in 40,000 or 60,000 acres in addition it was in effect a new project, and as to that new section we ought to seek cooperation. There passed the Senate in the last session and there was favorably reported from the committee in the House a bill that the Federal Treasury should bear the expense of financing these settlers. I do not believe it is the business of the Federal Government. Bringing the water, the Federal Government has done

its part. If the settlers are to be financed that is the obligation of the State or local interest. So we put a provision in. It has nothing to do with the present project, but does provide that before the 40,000 or 60,000 acres adjacent are developed, Montana or local interests must come in and take up the burden of financing. It is perfectly well for the bank to loan money at 8 per cent for a short time on crops, as Mr. Stephenson says they are doing on beets. The farmer can stand that, but settlers who come without a dollar and on projects where they have to spend considerable money to level the land and clear the brush I believe will need some financing. Farmers have bought land at high prices, with interest at 8 per cent, and paying 8 or 10 per cent for every loan needed, and then when there came a little slump they had to pay their 8 or 10 per cent, and the Government loan without interest had to wait. So we feel State cooperation is necessary in the future. What the form shall be we have not provided. We leave that to be negotiated between the department and the State and the local interests.

I am confident irrigation is going forward in this State. In the projects we have visited in the main we have been delighted by the business-like attitude of the men we have met. They intend to pay, and when we can once get that kind of promise translated into action I say to you that then Leavitt, Evans, Murphy, and I, all friends of irrigation, though we differ at some time in degree, can stand up in the House of Representatives and have something substantial to give to these 350 who have never seen the sagebrush, to convince them that reclamation is not the failure it has been pointed out. We can not go to them with whinings and tales of woe and claim that the Government is always wrong. Many mistakes have been made in the past on both sides. Now is the present, and the present in Montana has much of promise for the future. Let us step into that future, we who think we are business men, let us step off into that future trying to serve the interests of this State, and as we go on we hope we can have the encouragement and cooperation of you men who are living next door to the problem.

## UNCOMPAHGRE CROPS RENEW CONFIDENCE

A recent statement in the Montrose Daily Press puts the Uncompahgre project, Colorado, on a high plane as a crop producer and money maker. It appears that big crops and good prices are in evidence throughout the Valley, resulting in renewed confidence on the part of the settlers and the attraction of many home-seekers to the project.

The lowly onion is expected to produce to the extent of 1,800 cars, and at \$2 per hundredweight, this will mean more than \$1,000,000 to the Valley. The price of potatoes started at more than \$2 per hundredweight. Wheat began at \$2.50 and \$2.35 as compared with \$1.85 for hard wheat a year ago.

There will also be a good apple crop. The Catlin orchard is expected to market 30,000 boxes of first-class fruit at good prices.

With such bumper crops being harvested or in prospect of being harvested, and with prices looking the best for several years, Old Man Gloom has sort of evaporated around here.

In 1924-25 the value of the farmers' unencumbered capital was approximately \$47,000,000,000.

## COOPERATION

*A realization by leaders in the cooperative movement that cooperation is not merely a means for obtaining a better price for a single year's crop, but that it is a means for gradually adapting production to market demands, for insuring less wasteful distribution, for reducing the spread between what the farmer receives and what the consumer pays, for aiding in the solution of agricultural credit problems as they arise, for improving the rural life of the Nation, for insuring a better understanding of national and international problems—this realization, implanted by leaders and future leaders in the minds and hearts of the farm people of the United States, will do much to insure not only the success of cooperation, but increased prosperity and stability for the Nation.—The Secretary of Agriculture.*

The 1925 agriculture picture is painted in bright colors by the Department of Agriculture. As business conditions also continue good, the combination presents an optimistic national outlook.

## CROP SHIPMENTS FROM YAKIMA BREAK RECORD

Ordinarily, from an income standpoint, July is not a very good month for farmers, but the following statement shows that the Yakima Valley, the home of the Yakima irrigation project, Washington, had considerable produce to dispose of and took in a considerable amount of money during that month:

Shipments of fruits and vegetables from the Yakima Valley in the month of July aggregated 845 cars, valued at \$740,000 on board cars. Shipments of soft fruits during the month greatly exceeded those of a year ago.

The shipments of fruit to date this season are greater than for the corresponding period in 1923, which was the record crop year. Already (August 1) this season 626 cars of fruit have been shipped, as compared with 461 cars in 1923. During the month 174 cars of mixed fruits went to market, representing a value of \$300,000. The shipping of 208 cars of potatoes brought \$130,000 into the valley. Apples to the amount of 67 cars started the season's account of apple returns with an item of \$100,000.

Bumper crops, good prices, and optimism prevail.

## MAKING A FRESH START IN RECLAMATION

*The acid test of feasibility must be applied to all future projects in order that assurance may be had that the reclaimed land shall be capable of repaying the cost of reclamation*

*Editorial from Portland Oregonian*

VISIT of Secretary of the Interior Work and Reclamation Commissioner Mead to Oregon is an earnest of their desire to know from practical observation what should be done to make reclamation in this State a success, and to do it. They come here at a turning point in the history of Government reclamation, when a number of engineering successes have proved financial failures and when settlers have demanded relief while Congress has insisted that future projects be so managed that their products shall repay their cost to the reclamation fund.

Doctor Work has taken charge of affairs at a juncture when a man guided by cold judgment untinctured with sympathy and understanding would be apt to say the only thing to do about reclamation is nothing. Doctor Work knows that at least half the responsibility for past mistakes and failures rests on the Government and that by avoiding repetition of those mistakes and failures the Government can do all that is humanly possible to prevent settlers and others from making their half of the bad record again. Like many other big Federal enterprises, reclamation was undertaken in buoyant confidence that, if Uncle Sam put water on dry land, man, aided by nature, would do the rest, and the money expended would automatically flow back into the Federal treasury. Thought of the wide difference in value between the native growth of sagebrush and four or five crops of alfalfa a year raised visions of a great margin in land value which might be harvested by a city speculator. The opportunity of a good, safe living offered by an irrigated farm seemed so great that it was expected men—real farmers—would stampede to every reclaimed tract, and that thus the land would settle itself.

These illusions have vanished, and the Secretary approaches the task from an angle differing greatly from that of 23 years ago. Being a western man, he does not condemn reclamation by wholesale, but he would confine it to projects that are proved feasible by several tests which his fact-finding commission recommended and which Congress has approved. The great test of feasibility is capacity of the land, when reclaimed, to produce enough, in addition to a fair living for the farmer and to provision for payment of his debts, to repay the cost of its reclamation. That requires settlement of the

land with farmers who can and will make the land produce to its capacity and who would stay there.

On these lines the Government is making a fresh start in Oregon as in other States. The acid test of feasibility is to be applied to the Owyhee and Vale projects before expenditure of the appropriations begins. Feasibility is a broad term, for it covers engineering, cost in relation to possible production on the reclaimed land, settlement by men who will realize the possibilities of production

thority have erred in the same manner. The Government perseveres while profiting by its errors; the State should profit likewise, and Governor Pierce should come out of the pessimist mood he has shown in several speeches and should consider how the State may cooperate properly but effectively.

Selection of the right type of settler is as nearly as possible assured by the joint action of the Reclamation Bureau and the Oregon Land Settlement Committee, but many of them will need loans to the extent of half their investment in order that they may make a fair start and may soon begin payment of reclamation assessments. Congress has not authorized such loans though they were proposed in the Kenyon bill, and it is attempted to shift this part of the work to the State in making appropriations for the Kittitas and other projects. Governor Hartley refused to pledge the credit of Washington for so large and probably growing a liability, and Oregon may reasonably hesitate for the same reasons to undertake the task directly; but there may be other ways of insuring that settlers who have half the sum necessary to erect buildings and equip farms shall be able to borrow the other half at reasonable interest and terms of payment. The care to be taken that the reclaimed land shall be capable of repaying from its products the cost of reclamation and that the settlers shall be of a type that will remain on the land and make good should make the borrowers good risks from banker's viewpoint. Private owners of land within each project should be placed under contract to subdivide their holdings into certain farm units and to sell only at prices agreed to selected settlers. With these precautions financing of settlers might be undertaken by private agencies.

All that reclamation needs is a new start. The Oregon tracts for making it have been well selected. The most should be made of the opportunity by hearty cooperation of Federal, State, and private agencies in a plan the success of which will be proved by the creation of a farming community that meets all obligations for water and for loans, yet makes a good living for all its members and is in process of becoming financially independent. Such a community is a valuable asset to State and nation, and will be well worth the effort put forth in its creation

### GOOD TIMES AT HAND

*Considering this season by itself, I am convinced that it is going to be a fairly good year for agriculture. Considering this second year of improvement against the previous 4-year background of acute distress, I am ready to call agriculture safely convalescent. I was greatly encouraged in what I saw during my eight weeks' trip through the West.*

*On the whole I see stronger evidence of the approach of good times for agriculture than I have seen since 1920. One indication of this is the index of purchasing power of farm products, which is now about 90 per cent of what it was before the war, the level of this summer being the highest since 1920.*

*Moreover, I find an evident return of confidence. Farmers are getting out of the shadow of bankruptcy. Farms are selling once more. Long-standing debts are being liquidated. In short, agriculture appears to be gradually getting its house in order again after the post-war disruption.—The Secretary of Agriculture.*

and finance. Doctor Work and Doctor Mead are assured of the cooperation of the land settlement committee of the Portland Chamber of Commerce, but they seek the cooperation of the State in settlement and financing of settlers; at least, that is the inference to be drawn from Doctor Work's remark about waiting "until a law has been passed and appropriation made."

Oregon is in no position to criticize the Federal Government for its mistakes, for the State and those acting under its au-

## AGRICULTURAL AND ECONOMIC NEEDS OF THE PROJECTS

*The successful development of the projects demands that careful thought be given to their agricultural and economic needs as well as to their construction requirements. Some of these needs are outlined below*

**YUMA project, Arizona-California.**—Farming by tenants is much too prevalent on this project, and their places should be taken by settlers.

**Grand Valley project, Colorado.**—Of about 40,000 acres for which water is now available on the project, including Orchard Mesa lands, some 6,000 acres, largely in private ownership, are yet wholly undeveloped and fully 4,000 acres additional are very inefficiently farmed. To put these lands into proper cultivation at least 200 settlers will be required, and better facilities for long-time and intermediate credit are indispensable.

**Uncompahgre project, Colorado.**—Farming has been based largely on the production of staple cash crops, with disastrous results in many years owing in part to necessarily heavy freight and marketing charges. It is doubtful if transportation conditions can be improved sufficiently to provide material aid. The project should turn to crops and products better adapted to long hauls and high freight rates. Canneries and other industries for local conversion of products should be encouraged and supported. More and better livestock are needed. Many farmers have failed and left; new settlers are needed to take their places and to aid in the subdivision of larger holdings, but if they are to be successful they must be favorable to more intensive farming and must be properly financed through their development period.

**Boise project, Idaho.**—More livestock is needed on the farms, and there is a demand for canneries and other industries that will utilize cash crops of high value. High freight rates reduce the profit on bulky crops and sometimes result in losses. About 600 families could be put on the irrigated lands of this project to advantage by subdividing large holdings.

**King Hill project, Idaho.**—The principal needs of the project are the subdivision of the larger land holdings, more intensive cultivation, and more and better livestock, which, if supplied, will accelerate the development of the project and make the district better able to take over and successfully operate and maintain the works. About 60 new settlers are required. Better credit facilities with loans at lower interest rates are much needed.

**Minidoka project, Idaho.**—Much of the project is farmed by tenants who in general, together with some of the landowners, do not farm proficiently nor with results satisfactory to themselves. A

number of settlers of proper type are needed to displace these. More and particularly better grades of livestock are needed.

**Huntley project, Montana.**—Mortgage foreclosures have resulted in numerous holdings in excess of the established farm unit, and afford opportunity for a number of new settlers.

**Milk River project, Montana.**—A considerable portion of this project is held in large tracts. Good irrigation farming is rarely seen, and large areas are devoted to wild and tame grasses. The present settlers are averse to intensive farming, and to demonstrate results to be obtained thereby it would require the influx of 100 to 200 settlers, carefully selected for their proficiency in and preference for irrigation farming. These should be placed on a compact area to make a showing. Such a demonstration might bring about a change in agriculture of the region which up to the present time has not been of such character as to contribute to the return to the United States of its investment in canals or the cost of the operation of the system. Dairy stock needs improvement and the community generally lacks cheese factories, creameries, canneries, and other industries related to agriculture, although a beet-sugar factory is being erected at Chinook which will prove of benefit to many water users. No satisfactory long time or intermediate credit is available on this project. Before colonization can become active and successful it is believed this will have to be provided by some agency.

**Sun River project, Montana.**—Wheat is the predominant crop on the Greenfields division, with dry farming being practiced as much as possible, often to the detriment of crop production. Methods of farming should be revised, and farm areas, now aggregating in many cases 320 acres or more, should be subdivided. Many more settlers are needed in order to decrease the size of the farms and produce a change to agriculture based on production of stock and dairy products.

**Lower Yellowstone project, Montana-North Dakota.**—Development of irrigation has been very slow. The change from dry farming to irrigation farming is being made reluctantly and a large area of lands is still wholly fallow or not being farmed. Success in operation of the project makes imperative reduction in size of holdings. New settlers with an experience in irrigation farming are needed. A sugar factory

now in course of erection at Sidney, for its successful operation, will bring about more intensive cultivation of farms than has heretofore been the rule.

**North Platte project, Nebraska-Wyoming.**—Much of the project is farmed by tenants, seldom in an intensive way. Plans are needed to put tenanted lands under the operation of owners. Many ownerships should be subdivided. There is room for many settlers, but to make settlement successful, transfers of land require satisfactory prices and terms, social conditions must be favorable, marketing should be improved, and credit conditions warrant much attention both for long term and intermediate credits.

**Newlands project, Nevada.**—The long distances from this project to most markets and relatively high freight costs should be offset as much as possible by better marketing arrangements. Livestock on the project has been increasing, but more care is needed in selection. Many large holdings under old vested rights still exist which should be subdivided and disposed of to new settlers. Soil preparation, owing to unfavorable topography so often found, requires unusual expenditures prior to full crop production, and in obtaining settlers care should be taken to secure only settlers who are supplied with adequate capital. Local sources of capital are very limited and interest charges generally high.

**Carlsbad project, New Mexico.**—Cooperative institutions for marketing of crops and products are needed. The project has been found especially suited to cotton culture, and needs at least 200 settlers to permit the full development of this crop and of other intensive crops suited to the locality.

**Umatilla project, Oregon.**—Considerable land of extremely sandy nature should be eliminated from the project and means provided to transfer resident owners to better lands. The project has been to a large degree devoted to alfalfa production, much of which has been shipped out baled or as alfalfa meal. More livestock should be held locally to consume alfalfa production and aid in improving the lands.

**Klamath project, Oregon-California.**—A considerable number of large holdings of land scattered through the project require subdivision. Generally, intensive irrigated agriculture is needed. The successful development of the Tule Lake

(Continued on page 136)

## THE FARM COMMUNITIES ASSOCIATION

**T**HE Farm Communities Association, whose president is Dr. Alvin Johnson and whose general counsel is Mr. Matthew Hale, 25 Broad Street, New York, N. Y., was organized to help safeguard the national welfare of the United States by making actual working demonstrations of attractive and remunerative country life. Through its principles and purposes the work of the association is linked closely with that of the Bureau of Reclamation in its work of bringing about better economic conditions on the irrigation projects.

### PRINCIPLES AND PURPOSES

Realizing that the well-being of those who produce the primary wealth of the Nation by cultivating the soil is of vital importance to the economic development of the country and the perpetuation of our national institutions, and that this desired condition can not with certainty be brought about either through private enterprise or through the unaided action of departments of our Government, the Farm Communities Association contemplates a complete cooperation with all governmental departments now inter-

ested or hereafter to be interested in the promotion of better farm life conditions and will particularly endeavor through publicity and through the usual methods of organization to awaken the public interest which will find expression through the people's representatives in Congress in measures which will make it possible for departments of the Government to function advantageously and work out the principles of successful agriculture under the supervision of Government departments and in their cooperation with States and private interests. It is believed that this purpose can be accomplished by the establishment, under certain conditions, of communities which shall be essentially agricultural in nature, but which shall also contain certain industries supplemental to agricultural activities. These communities are referred to as "farm communities."

### PRINCIPLES TO GOVERN ESTABLISHMENT

The following principles will govern the establishment of farm communities by this organization:

(a) The choice in each case of a healthful location suitable for the development

of a system of intensified and diversified agriculture which will enable owners of small farms while raising their own food supplies to conduct profitable farming operations in an agreeable environment.

(b) The establishment of industries supplemental to agriculture to such an extent and under such conditions as to provide for a well-balanced and economic life without rendering the farm community less attractive or less healthful for the inhabitants.

(c) The development and scientific guidance of the farm community in such a manner as to insure the economic success of the inhabitants and at the same time to provide the fullest opportunities for intellectual development and social intercourse.

(d) The provision of ample capital for carrying out the project. The element of philanthropy will be eliminated by providing for a fair return on invested capital. All revenues of the developing corporation above fixed percentage on invested capital shall be devoted to the welfare of the community.

(e) After the success of the first farm community is assured, it is the intention of the association to give nation-wide scope to its plans by the establishment of similar farm communities throughout the country. With this in view, the association purposes to choose a truly representative group of advisers and to secure the services of the best experts available.

## NEEDS OF THE PROJECTS

(Continued from page 135)

lands yet to be opened will require a carefully worked out colonization and settlement plan in which settlers should be selected, their undertakings surrounded by adequate credit, and attention given to the formation of cooperative institutions.

*Belle Fourche project, South Dakota.*—A change in farming methods to more intensive agriculture based on careful cultivation of higher-priced crops and raising of livestock with a breaking up of large holdings is the greatest necessity. The project is too much dependent on tenants, and lacks cooperative institutions and satisfactory sources of credit to aid in development. Means should be found of effecting change in ownership where present owners are either incapable or unwilling to develop their holdings along proper lines. About 500 experienced farmers are needed to make full development possible.

*Strawberry Valley project, Utah.*—More of the project lands should be devoted to higher-priced crops, such as canning

factory product and small fruits, as is being done on other irrigated lands in the same general vicinity.

*Okanogan project, Washington.*—Agriculturally the project is in need of better facilities for long-time credit.

*Yakima project, Washington.*—Land acquired through foreclosure by loan agencies and land held by nonresidents are usually farmed in a haphazard way, which should be corrected by a plan of sales to settlers based on proper land valuation and satisfactory terms of purchase.

*Riverton project, Wyoming.*—Long distance to railroads and the lack of local markets, except for a limited amount of feed for stock, call for the production of concentrated products of high value such as butter, cheese, eggs, meat, and honey. The project is undeveloped and in many places otherwise unattractive by reason of topography and soils of indifferent character. The lands should be settled under a carefully devised plan based on selection of settlers, adequate financial support, and a system of agriculture

suited to the conditions. Cooperative and social organizations and institutions are wholly lacking and must be provided. No doubt some experimentation with crops will be necessary before a proper solution is found, followed by demonstration on a scale adequate for the purpose.

*Shoshone project, Wyoming.*—The Garland division is practically all irrigated, but is in need of settlers to facilitate subdivision and to replace tenantry. On Frannie division, irrigation practice in many cases developed unexpected poor soil conditions, resulting in later abandonment of many farms. Rehabilitation must be preceded by soil improvement. A competent agriculturist should assist in this work and experimental as well as demonstration work should be financed. The difficulties of permanent settlement and profitable farming will require careful selection of settlers with advice and their activities aided to a high degree. Conditions on Willwood division are expected to parallel, though probably to a less unfavorable degree, the conditions on Frannie division. Cooperative institutions are needed throughout the project.



## STRAWBERRY PRODUCTION ON THE YUMA PROJECT

*Two important lessons from this development are that success is due to careful planning and working up the fertility of the soil, and that proper fertilization has produced a berry in a class by itself*

*By Porter J. Preston, Superintendent*

**I**N January, 1918, S. M. Colby purchased a farm unit 7 miles northeast of Yuma, Ariz., on the reservation division of the Yuma project. The unit contained 39 irrigable acres of what is usually classed on this project as sandy land.

Mr. Colby (as many others were at that time) was imbued with the idea of making big profits from raising cotton. For three years his main crop was cotton. In 1920, when the bottom dropped out of cotton prices, he found that his crops and other assets would not take care of more than one-half of his indebtedness. He fully realized that he would not be able to make a living and meet his obligations upon this farm unit and continue to grow cotton. The soil was depleted from raising cotton and the entire place needed releveled. At this time he held a conference with his banker and discussed the problem of going into truck gardening. After a thorough discussion of the situation with the banker and impressing upon him the necessity of making a considerable investment in the upbuilding of the soil in the way of fertilizing, releveled, deep plowing, etc., the banker agreed to back him.

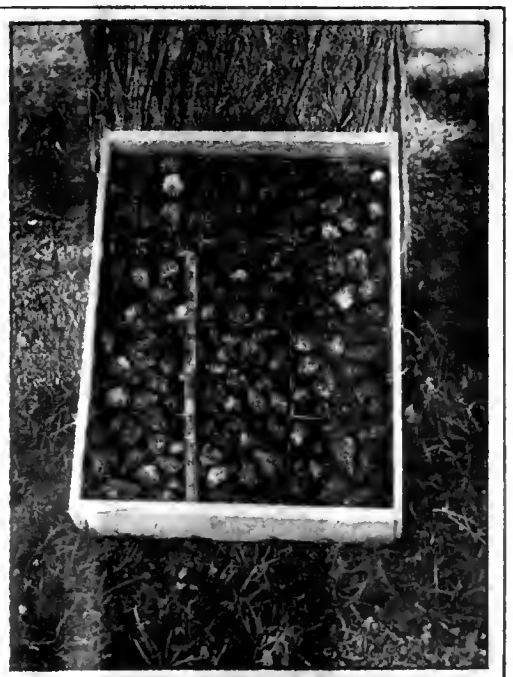
In the spring of 1921 Mr. Colby began releveled and fertilizing the ground by the use of barnyard manure which he

obtained from his neighbors; a vegetable crop was grown in the winter and cover crops of cowpeas in the summer. Deep and thorough plowing was practiced even upon lands that were mainly white sand. Some of the land originally had less than 2 inches of soil overlying the sand. Some commercial fertilizer was used to supplement the barnyard manure and cover crops. In the beginning commercial fertilizer was used rather sparingly, but the good results obtained from it led Mr. Colby to use more and more as time went on. At first his efforts at growing vegetables were rather discouraging for the reason that so much was undersized and not of commercial quality, but with better soil fertility these difficulties began to eliminate themselves and the quality and quantity of yield improved from year to year.

In the fall of 1922 he planted his first acre of Carolina strawberries upon ground which had received two years' application of barnyard manure and had had two cover crops of cowpeas grown upon it. The plants were put out in November. Considerable amounts were expended in releveled the land to an exact level. In 1923 a small crop of strawberries was picked, and in October of that year 2 acres more were planted upon ground that had received the same treatment as

the acre planted the previous year. In 1924 a good crop of 500 trays of 12 pint boxes per tray were picked per acre from the 3 acres. The market conditions that year were somewhat confusing, as the Yuma locality and Arizona were quarantined against California, owing to the foot-and-mouth disease that had been prevalent in that State. This gave rather an uncertain market, and it was somewhat doubtful whether the prices that were then received for the berries would be maintained in a normal year. In 1925 from these 3 acres 3,000 trays of 12 pint boxes per tray were marketed. Fifty per cent of the crop was disposed of to the local market and the other 50 per cent was shipped mainly to Bisbee and Douglas, Ariz., and New Mexico points; 75 per cent of the crop was No. 1 grade and 25 per cent No. 2. Great care was exercised in grading the berries. Prices were good during the season. The No. 1 grade berries averaged \$2 per tray and No. 2 grade \$1 per tray at Yuma. The cost of placing the berries upon the market has been rather high, as proper and experienced help was not available. Considerable of the help obtained for the past two years consisted of local people, and as this help will be available in the future it is anticipated that

(Continued on page 138).



Strawberries grown on the Yuma project, Arizona-California



## COMMENTS ON THE ECONOMIC REPORT

THE recent report, prepared under the direction of Commissioner Elwood Mead, on the economic feasibility of seven proposed irrigation projects in the West, has been distributed to a carefully selected list of persons who, it was believed, would be especially interested in the discussion of the economic problems involved. A large number of replies have been received commenting on the report, and from these the following are selected as typifying the reactions of those who have evidently given thoughtful consideration to the questions discussed:

"A report of this nature can not help but clarify the general situation in regard to reclamation matters and tend to put it on a sound basis which all thoughtful people can approve."—*A State engineer.*

"The variety of phases covered in your investigations and methods adopted were interesting to me, and I can offer only commendation upon the manner in which you have reduced your report into the intensely practical returns that might be expected from the expenditure of Government funds."—*A director of public works.*

"Your report impresses me as being very complete and contains information

### YUMA STRAWBERRIES

(Continued from page 137)

it will be much more efficient as they become more experienced, thus reducing the cost of placing the product upon the market.

Mr. Colby is putting out 4 acres additional this coming fall and anticipates no difficulties in the marketing situation, as during the past season the demands for his berries were more than double what he could furnish.

The writer has been familiar with this development and its progress from the beginning. Two very important lessons stand out in this development that should be emphasized. The first is that Mr. Colby's success is not due to accident but to careful planning several years in advance and working up the fertility of the soil to a point where quantity production is obtained; and, second, that proper fertilization has produced a berry which stands in a class by itself. His No. 1 grade strawberries are of excellent quality, and when the quality is produced there is an ample market for it at good prices with very little competition.

that will be invaluable."—*A secretary of a chamber of commerce.*

"The report is an excellent piece of work, well presented."—*A city water engineer.*

"It is a very valuable compilation, containing as it does facts relative to projects which are the subject of much discussion in Congress."—*A Member of Congress.*

"I wish to commend the form and vigorous treatment adopted, and also to concur with the conclusions expressed on such of the enterprises as I know personally."—*A public roads engineer.*

"I know I shall gain much of very great value from this report to assist us in our work in this Territory."—*A Territorial Governor.*

"I congratulate you on the completeness of these reports and the broad manner in which they have been compiled, so different from the former haphazard method of going ahead with their construction and then expecting the farmer to work out his own salvation with indifferent aid and encouragement."—*A well-known economist.*

"I believe in supervised and directed development, and consider the reports most valuable."—*A railroad official.*

"One important fact which this report brings out is that there is a great deal more to the matter of successful reclamation through irrigation than mere engineering. That is a point which I think has not been fully understood, especially by engineers in the East. I am very much pleased to note that the other features of the matter are receiving such careful and adequate attention even though I as an engineer am naturally inclined to stress the importance of the engineering features of the subject."—*A hydraulic engineer.*

"Your present plan of submitting a report on the economics of the project with the other data necessary should do away with any future criticism that the officials of the bureau have in past times been overenthusiastic, and have reclaimed some land at too great a cost, all things considered; it being assumed of course that the economic report is written by seekers after facts, and not by enthusiasts. This feature of the reports I think can not be too highly commended."—*A professor of engineering.*

"The report contains considerable valuable information, much of which can be used in this department at the

present time in comparison of irrigation districts."—*A commissioner of public lands.*

"The report is an extremely interesting compilation of facts and figures."—*A general manager of a chamber of commerce.*

"I have gone over the report sufficiently to know that you have made a very comprehensive study of these proposed projects. I am confident that the information contained in this report will prove to be extremely useful and helpful to us in the development of our work in the Department of Economics and Sociology in this institution."—*A professor of economics and sociology.*

"You have made a most favorable contribution to the reclamation program. It is frank statements and clean-cut opinion based upon careful survey that should bring about the right type of Federal aid and assistance in the promotion of the logical and worthwhile projects."—*A secretary of a chamber of commerce.*

"I have perused the report with much interest, marveling how you managed to get so many individual bankers, business men, farmers, educationalists, and others to cooperate with you. The information collected is just what is needed."—*An eminent Australian civil engineer.*

### SECRETARY'S DECISION NOT TO BE OVERTURNED

Before the construction of the Salt River project, Arizona, owners of lands who desired water for irrigation formed a corporation known as the Salt River Valley Water Users' Association, and subscribed for stock for an area in excess of that susceptible of irrigation from the existing water supply. The stock subscription contracts and articles of incorporation of the association left it to the Government to determine the extent of the available water supply. Plaintiffs had subscribed for stock in the association, but on account of the Secretary's determination, their land was deprived of water when the boundaries of the irrigable area of the project were fixed in the Secretary's public notice under the reclamation act. Plaintiffs sought to secure by court action a reversal of the Secretary's findings, so far as their land was concerned. It was held: "In such a case certainly a court may not substitute its judgment on those points for that of the Secretary, but his decision as to available water, and land to be included in the project, stands until he modifies it himself." (*Salt River Valley Water Users' Association v. Spicer*, May 26, 1925, 236 Pac. 728.)

## CONSTRUCTION OF McKAY DAM, UMATILLA PROJECT

*It is expected that all features of the dam, which was begun in July, 1923, will be completed by the fall of 1926, and that water may be stored for the irrigation season of 1927*

*By Ralph Lowry, Resident Engineer*

**T**HE McKay Dam which is being constructed by the Bureau of Reclamation is located on McKay Creek about 5 miles above the confluence of the creek with the Umatilla River and 7 miles south of the town of Pendleton, Oreg. The dam when completed will create a reservoir about 4 miles long and a mile wide having a storage capacity of 73,000 acre-feet. The stored water will be used in supplementing the natural flow of the Umatilla River for the irrigation of some 38,000 acres of land, now partially developed, and located along the river in the vicinity of the towns of Echo, Stanfield, and Hermiston. The construction work on the dam, which started in July, 1923, is being done by Government forces and consists essentially of three main features, namely, the gravel fill, spillway, and outlet tunnel.

### THE GRAVEL FILL

The gravel fill has a top length of 2,700 feet, a maximum height above the creek channel of 165 feet, a 2 to 1 downstream slope, a  $1\frac{3}{4}$  to 1 upstream slope, and will contain when completed 2,300,000 cubic yards of embankment material. The material for making the fill consists of a well-graded gravel containing a varying content of earth and sand. It is secured from the valley floor upstream from the dam site where, after being wetted, it is excavated with two 80-B electrically-operated Bucyrus shovels, loaded into 4-yard dump cars, and hauled with 18 and 20 ton dinkey locomotives, an average of  $1\frac{1}{2}$  miles to the dam. After reaching the dam the material is dumped in longitudi-

nal rows spread to a thickness not exceeding 8 inches with horse-drawn grading machines and compacted by rolling with traction engines.

Work on placing the gravel fill started in February, 1924, and continuous operation has been maintained since that date with the exception of about one month during the winter of 1924-25. One million seven hundred thousand cubic yards of embankment material had been placed to July 1. The maximum quantity placed during any one month was 166,000 cubic yards and the maximum daily run was 8,000 cubic yards; in each case two shifts of eight hours each were employed. In addition to the two electric shovels, the principal items of equipment used in making the fill consist of 11 dinkey locomotives, 120 4-yard dump cars, 5 traction engines, and 3 grading machines.

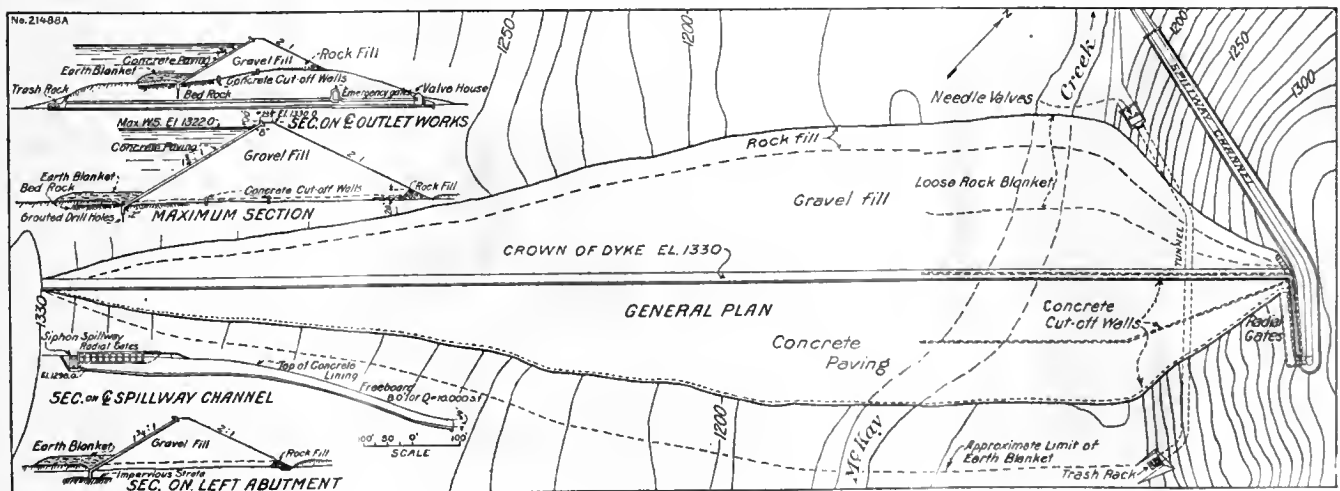
The  $1\frac{3}{4}$  to 1 upstream slope of the gravel fill is to be entirely covered by a layer of continuous concrete, which totals about 16,000 cubic yards, all of which is to be reinforced with  $\frac{3}{4}$ -inch round rods spaced 18 inches centers both ways. The thickness of the concrete face varies uniformly from  $12\frac{1}{2}$  inches at the upstream toe of the fill to 8 inches at the parapet wall on top of the dam. The concrete face terminates in a concrete cut-off wall, which is located along the upstream toe for the full length of the dam. The cut-off wall is placed in a trench which had been excavated in the lava rock foundation. Grout holes were put down into the lava rock from the bottom of the trench to a maximum depth of 45 feet by using a model 21 Turbro drill mounted on

a derrick. The holes were spaced at intervals not exceeding 10-foot centers and in places were spaced as closely as 3-foot centers. Cement grout was forced into the holes by air under a pressure which did not exceed 100 pounds per square inch. Work was started in the fall of 1923 on both the upstream cut-off wall and the grouting, and has been carried on almost continuously since then, during which time 1,600 cubic yards of concrete have been placed in the trench and 10,000 linear feet of grout holes have been drilled and grouted. Before any work could be done on the gravel fill it was necessary to strip the top soil down to compact gravel or solid rock over the greater part of the left abutment and across the valley floor. This work was started in July, 1923, and was done with fresnos and dump wagons, the latter being loaded by an Austin dragline equipped with a one-half yard bucket. All top soil was removed from the base of the dam and deposited near the upstream toe where it will later be spread into an earth blanket. Stripping operations resulted in the removal of 160,000 cubic yards of top soil.

### THE SPILLWAY

The spillway is located in the lava rock of the right abutment at the end of the gravel fill. It is of the side-channel type, the channel being lined with concrete. Flow into the spillway channel is controlled by a concrete gate structure containing six 20 by 10 foot radial gates and a two-barrel siphon spillway. The spillway is designed to pass 10,000 second

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Plan and section, McKay dam, Umatilla project, Oregon

## McKAY DAM CONSTRUCTION

(Continued from page 139)

feet, in addition to which a liberal allowance for freeboard is made. Of the 31,000 cubic yards of rock to be excavated from the spillway channel 29,000 have been removed. The rock is drilled with jack hammers, shot, and moved down the spillway channel to its lower end by means of power-operated drag buckets. At the lower end of the channel it is loaded by gravity in 4-yard dump cars and placed in the downstream toe drain of the embankment. Present designs call for placing 3,000 cubic yards of concrete to complete the spillway structure.

### THE OUTLET TUNNEL

The outlet tunnel has been driven through the lava rock under the right abutment of the dam. The tunnel will serve a double purpose. It is being used now to divert the natural flow of McKay Creek around the embankment while the latter is under construction. After the dam is completed and the tunnel is equipped with the necessary gates and apparatus it will be used for controlling the release of the irrigation draft from the reservoir. The tunnel is 705 feet long, and is lined with concrete for its full length. The release of the irrigation draft will be effected by the use of two sets of gates, one set of two emergency gates, and one set of two balanced needle valves.

The emergency gates which cover 4 by 4 foot openings are located in the tunnel 550 feet from the intake portal. These gates are the plain sliding type, piston operated with oil under pressure. The emergency gates are not to be operated

at partial openings but are to be used primarily for inspection and repairs to the balanced needle valves. The valves which are 48 inches in diameter are located at the outlet portal of the tunnel and each of the two valves is connected to its emergency gate by means of a steel pipe 54 inches in diameter. The portion of the tunnel from the emergency gate chamber to the intake portal is a 10-foot diameter horseshoe section. This portion of the tunnel will be under reservoir pressure and has been thoroughly grouted. The portion of the tunnel from the emergency gate chamber to the outlet portal will be open and through it access will be had to the operating chamber of the emergency gates.

The tunnel was driven from both portals. Work was under way in good shape by the middle of October, 1923, and the tunnel was holed through on December 22. It was driven through rock which varied from a hard blue basalt to the softer forms of lava. No unusual difficulties were encountered in driving the tunnel and it was not necessary to timber. Air for drilling was furnished by a 13 by 14 inch Laidlaw compressor driven by a 75-horsepower motor. The rock excavated in the tunnel was placed in the downstream toe drain of the embankment.

A connected electric load of about 500 horsepower is maintained in operating the equipment including the 80-B shovels, machinery in the shop, compressor, a hoist at the spillway, and several pumps. Part of the load is used for lighting the camp and the work. The electric power

is purchased from the Pacific Power & Light Co. The dinky locomotives and four of the traction engines are fired with crude oil.

A plentiful supply of labor has been available since the work started and a maximum force of 300 men has been employed.

Gravel for concrete is obtained in the borrow pits above the dam. Owing to the large number of cobbles and the considerable amount of dirt encountered, the pit run material is put through a crusher and thoroughly washed before screening. The sand is obtained from natural deposits near Hermiston, Oreg., from where it is shipped by rail a distance of 42 miles to Sparks station and is then hauled by truck  $2\frac{1}{2}$  miles to the dam.

Present progress indicates that all features of the McKay Dam work will be completed by the fall of 1926 and that water may be stored for the irrigation season of 1927.

### THE VIEWPOINT OF A SUCCESSFUL FARMER

The following letter was received by Secretary Work on July 21, 1925:

"I wish to congratulate you on your announced policy toward future irrigation projects as reported in AP dispatches from Washington this morning. The utter folly of throwing more money away on unnecessary irrigation projects should stop. It is not the actual farmer who is in such a hurry to reclaim all the desert land in the United States at the public expense, nor is it the citizen who wants the land for a home. The latter can find plenty of that now at nominal cost. The people who are pushing so insistently for more reclamation projects are the boosters, the boomers, and the grafters who are hoping and planning to skim easy profits by hook or crook through the expenditure of huge sums of Government money. This gentry would not go on this land themselves—not on your life. They are looking for easy money.

"I have lived upon and farmed a 40-acre tract for 31 years. I grubbed the sage brush off with my own hands, and know all about the trials of the pioneer. I have a beautiful place, and would welcome the time when all our section of the State could be equally well improved but I recognize the futility of attempting it at the present time."



McKay dam under construction

## HELPING MEN OWN FARMS IN ENGLAND

IN the Saturday Evening Post for August 15 an interesting article by Will Payne, entitled "An English Farmer," describes some of the experiences of the Government of Great Britain in helping men own farms which has a direct bearing on the problems of the Federal Reclamation Service.

In 1907 the British Parliament, moved by the continued decline in the number of farmers on the land and in the home production of breadstuffs, sought by legislation to increase the number of family farms which would be owned and mainly worked by the occupant and his family. One reason for this legislation was the success which had attended the movement in Ireland to replace the discontented and rebellious tenant with the small-farm owner. It was pointed out also by those who favored this movement that while agriculture in England was declining, it flourished in other countries where the typical tiller of the soil was its owner.

The act passed by Parliament in 1907—"empowered county councils to acquire land compulsorily for the purpose of allotting it in small holdings to actual tillers. They might also purchase or lease land by agreement with the owner and resell or lease it to actual cultivators. Having acquired the land, they were further empowered to adopt it to small holdings by erecting dwellings and barns, fencing it, draining it, etc. The necessary money was to be raised by bond issues, and the national government agreed to reimburse the councils for half of any loss they might incur in these operations. Also if any conservative county council refused or neglected to participate in the scheme, the national government might take the matter into its own hands by transferring the local powers of such recalcitrant council to a small-holdings commission, which would buy or lease the land, improve it with buildings where necessary, and resell or lease it to small holders."

### THE SMALL-HOLDINGS ACT

"But the act provided that the purchaser should pay down, on taking possession, at least one-fifth of the purchase price, the remainder to be paid in installments over a long period. Also it set forth that the land was to be sold or leased to small holders on terms which, in the judgment of the county councils or the small-holdings commission, would cover the cost to the taxpayers. Thus, as a parliamentary report observes, 'the principle un-

derlying the act is often described as the self-supporting principle.'"

Between 1907 and the Great War 189,294 acres of land had been purchased in England and Wales and parceled out among 13,381 small holders and actual cultivators. As this was controlled by county councils the results were not always the same, but the total cost to the government was about \$10 an acre, and this was mainly due to the necessity for purchasing the costly homes and out-buildings of large land owners, which could not be utilized or sold for the amount paid for them. This loss also includes interest, which was charged and would not exceed two years' interest. If money had been furnished without interest, as is done by the Federal Government on reclamation projects in this country, the results would have shown a gain rather than loss.

The war interrupted this movement. After the close it was resumed, but with a fundamental change in its objective and under far more difficult conditions. Before the war the movement was to help qualified cultivators become land owners, but after the war the primary object was to provide farms for soldiers, and the earlier safeguards which made the movement self-supporting, were discarded. The old act required the purchaser to have some capital, as he had to pay one-fifth of the cost in cash. He also had to show a knowledge of farm practice and some farm experience.

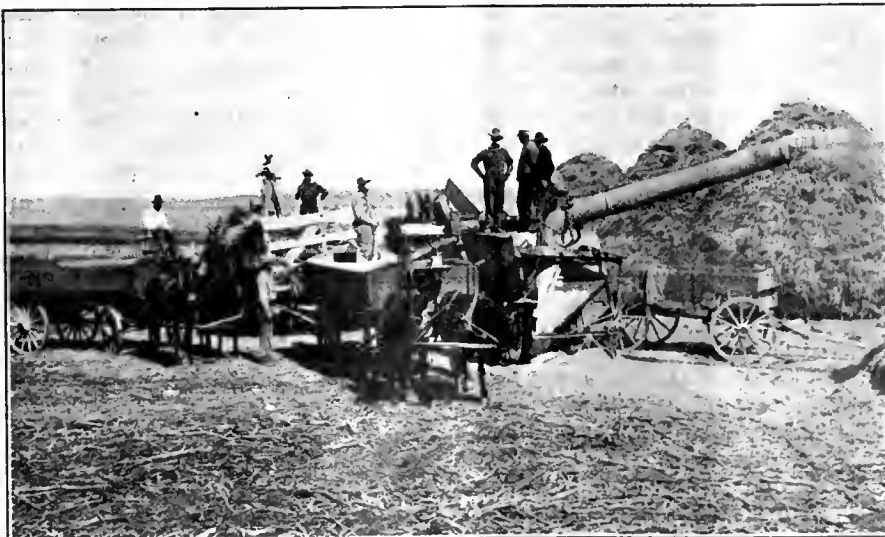
Under the new act they are not required to pay anything down—repayment of the

whole purchase price being spread over 50 years. The new act also authorizes county councils to make loans to small-holdings purchasers or lessees for the purpose of buying livestock, fruit trees, seeds, fertilizers, and implements. And for the encouragement of the councils, the national exchequer undertakes to shoulder all the loss. But the new act requires that in allotting small holdings preference shall be given to ex-service men. In fact, it has been operated almost entirely for their benefit.

The development of farms after the war was far more expensive than under the earlier movement. Exorbitant prices had to be paid for labor and for the material which went into farm homes, so that on some of the farms the improvements alone cost as high as \$9,000. The result of this second movement has been a heavy loss, amounting probably to \$39,000,000, which will fall on the Government. In other words, aid in settlement where it was based on requiring the settler to have some capital of his own to underwrite that furnished by the Government, and requiring him to have a knowledge of farming, was a success. Where these safeguards were ignored, it became a costly failure.

The reclamation development of this country was started with the idea that settlers could be accepted without capital or farming experience. It is now recognized as unworkable under existing conditions. The earlier attempts of Great Britain seem to throw some light on the policy which should be adopted here in the future extension of the reclaimed areas.

Fruit is not so plentiful in eastern districts, but the Pacific coast will make good much of the deficiency.



Threshing on the North Platte project, Nebraska-Wyoming



## LOWER RIO GRANDE DELEGATION VISITS PROJECT

*Party of forty-six irrigationists pays visit to Rio Grande project and is impressed with cordial spirit of cooperation between Government officials and water users*

*By C. H. Pease, Secretary Lower Rio Grande Valley Water Users' Association*

A PARTY of 46 Lower Rio Grande Valley citizens, traveling overland in a caravan of 15 automobiles, recently paid a visit to the Rio Grande project and the Elephant Butte Dam. The purpose behind this trip was to find out what the actual conditions were on an irrigation system which had been built by the Government and was being operated by the Bureau of Reclamation.

The Lower Rio Grande Valley, where the caravan originated, is an exceedingly rich and productive section which has been developed entirely by private enterprise. There are 15 entirely independent irrigation systems, each having a checkered history of its own. Ten of these are now controlled by irrigation districts. The source of water supply is the normal flow of the Rio Grande lifted by means of pumping plants into the main distributing canals. In some instances a second lift is necessary to reach the main project lands. The total lift varies from 12 to 50 feet, and the cost of irrigation varies from \$6 to as high as \$12 or \$15 an acre per year.

The desirability of securing a more economical system of irrigation and of increasing the water supply by storage has been recognized, and some years ago the Bureau of Reclamation was employed to make a study of the physical conditions and make recommendations. The result was the outlining by the Government engineers of a system of storage and gravity diversions which has been the subject of much discussion and some controversy among valley interests ever since.

The announcement by the Gravity Irrigation News of a caravan to visit the proposed storage sites in the Big Bend region of the Rio Grande and to inspect the Government project at El Paso attracted immediate interest. But for the fact that the cotton-picking season came on three weeks earlier than normal this year there would have been at least 100 automobiles in the party, but as it was the party was sufficiently representative to cover practically every valley community.

The visit to the Mariscal and Boquillas Canyons in the Big Bend, located far from the beaten path, and in a region difficult of access, was an arduous feat, but in spite of the difficulties, men, women, and children braved the heat and the barren rocks and climbed to vantage points where the best views could be had. The

conviction was general that the Government men had located ideal sites for great storage dams.

The party reached El Paso after being 10 days out. Here they were welcomed by Mr. Bandeen, of the chamber of commerce, by Mr. Roland Harwell, of the El Paso irrigation district, and by L. M. Lawson, superintendent of the Rio Grande project. The following day they were tendered a luncheon by the chamber of commerce, and among the speakers present were the presidents of the two irrigation districts, representatives of the El Paso and Las Cruces Chambers of Commerce, Major Richard Burgess, who was intimately associated with the creation of the Rio Grande project and is a well-known authority on irrigation law, and Mr. Lawson, superintendent of the project.

Here in one gathering were representatives of the commercial interests, of the farmers, and of the Government, as well as a widely known irrigation attorney. Certainly no finer opportunity could be had to secure first hand and authoritative information. The members of the party took advantage of the opportunity and asked numerous questions which were answered with perfect frankness.

One of the things that impressed the visitors was the splendid relations that seemed to exist between the Government men and the farmers. Everyone present was emphatic in the statement that while there were occasional differences of opinion as to methods and policies, these differences were thrashed out in conference and the final action was the resultant of the agreement that followed such conferences. No evidences of antagonism or friction could be found. Another point that was brought out was the economy and efficiency of Government work and construction on this project. The presidents of both districts agreed that the construction work that had been done on the project had been well done, and had been done at a cost lower than private contractors would attempt it. The cheapness of the water service simply astonished the valley men. They could not understand how a whole season's water supply could be provided for a cost as low as \$2.27 a year, which was given as the average cost of water the past season to the farmers.

Following the luncheon, the caravan lined up and was escorted to the International Dam, where a demonstration of

the operation of the desilting basin was witnessed. This was of great interest, as the silt problem is the source of a great deal of expense to valley irrigators. The drive continued to the Mesilla dam, passing through the irrigated farms of the Mesilla Valley en route. Splendid crops of cotton, melons, and other truck crops were to be seen. The caravan camped at the beautiful camp ground adjoining the dam. That evening the members enjoyed the visual demonstration of gravity irrigation as they saw the rushing waters diverted through the gates into the two canals heading at this dam, and learned that the total expense of operating this dam was but \$120 a month.

Through the courtesy of Doctor Kent, president of the Agricultural and Mechanical College of New Mexico, and Professor Garcia, director of the New Mexico Experiment Station, the visitors were shown the college and the demonstration plots at the experiment station, which was greatly enjoyed. There was an informal reception the next forenoon tendered by the Las Cruces Chamber of Commerce at their headquarters in Las Cruces. Then the party, led by Mr. Lawson and Mr. Taylor, president of the irrigation district, started for the Elephant Butte Dam. The Leesburg diversion dam was visited on the way. Late in the afternoon the big dam was reached. Each member of the party was furnished with a room at the Government hotel, which was a welcome relief from camp life. Meals were furnished at the Government mess hall by the two irrigation districts and the Dona Ana Farm Bureau.

These meals constitute one of the bright spots of the trip, for the elaborate menu was in marked contrast with the necessarily limited fare of our camp meals. Notwithstanding the lively appetites which we had developed, we were unable to consume all the food that had been prepared for us.

On the evening of our arrival at the dam we all went down to inspect it. Led by Mr. Lawson, the descent down the long stairway into the interior of the structure was made. As we went down, down, down, the thunder of the waters being released through the enormous valves became louder and louder until conversation became difficult. The electrical mechanism that operates the valves was explained to us. The tremendous



magnitude of this man-made structure was truly impressive. Emerging from the interior through a long hallway we found ourselves at the foot of the dam. At our feet the tumultuous waters were being discharged under a pressure that was awe inspiring. Looking upward far above our heads the beautiful and harmonious lines of the wonderful structure were outlined by rows of electric lights against the starry sky. We stood for a moment in silence, trying to grasp the full significance of this scene. We were assured that for many miles above, the bed of the Rio Grande, source of the water supply, was a mere expanse of barren sand. No

water had been seen in it for months. Yet here was a lake of water held in leash by the big dam, sufficient to feed the raging torrent at our feet for months without perceptible diminution. The waters now being drawn upon were the same that had swept down the valley above over a year ago, and but for the dam before us would have left devastation in its path in the populous communities below. The waters which were bent on destruction last year are this year put to work to produce abundant crops in a valley that would otherwise have burned up with drought.

Our people looked with a feeling of

intense admiration on the stately structure before them. They acknowledged a feeling of respect for the men who could design and build such a work which could thus curb the forces of nature and bend them to serve mankind. They also formed a firm determination to never cease effort until the remainder of the Rio Grande which lies below this dam shall have a similar control placed over it, to the end that the people of the Lower Rio Grande Valley may be the masters rather than the slaves of the river on which they must needs depend for the maintenance of the communities which they have founded there.

## ELEPHANT BUTTE DISTRICT TO YIELD \$7,000,000 THIS YEAR

**T**HE New Mexican, of Santa Fe, reports that the Elephant Butte irrigated district of New Mexico, through diversified farming, with two or three great money crops, will yield farm products worth more than \$7,000,000 this year.

These figures are based upon reports of returns already received and upon careful estimates of the returns that will be obtained from crops that are yet to be harvested and marketed.

With all crops in splendid condition, including fruit, cotton, alfalfa, cantaloupes and other truck crops, and with a steadily growing output of dairy and poultry products, the Elephant Butte district promises to surpass its record-breaking production of 1924, pushing the average value of its products per acre well above the \$100 mark. Last year, according to the census of the Bureau of Reclamation, the average value of farm products of the Elephant Butte project was \$97.20 an acre, not including the big item of live-stock, and dairy and poultry products.

Last year there was practically no fruit, owing to the usually late frost, but this year the valley has one of the greatest fruit crops in its history. At the same time the returns from all other crops promise to be as great or greater than those of last year, which will bring the average production per cultivated acre up to a figure considerably in excess of that of 1924.

With probable greater returns per acre and with an increase of approximately 14,000 acres in the cultivated area in the district, the estimate of a \$7,000,000 farm crop seems to be conservative.

While cotton will again be the greatest money crop of the district, the record of returns from other crops and farm products and the increased acreage in many

crops other than cotton show wide diversification.

Cotton, alfalfa, cantaloupes, and dairy products will account for the greater part of the district's \$7,000,000 crops this year, but the total will include returns of considerable magnitude from fruit, poultry products, and a great variety of truck crops, such as sweet potatoes, spinach, beans, chili, and asparagus.

This year's returns from some of the district's important crops are estimated as follows:

Cotton and cottonseed .....	\$4,000,000
Alfalfa .....	1,000,000
Cantaloupes .....	1,000,000
Dairy products .....	1,000,000
Poultry products .....	100,000

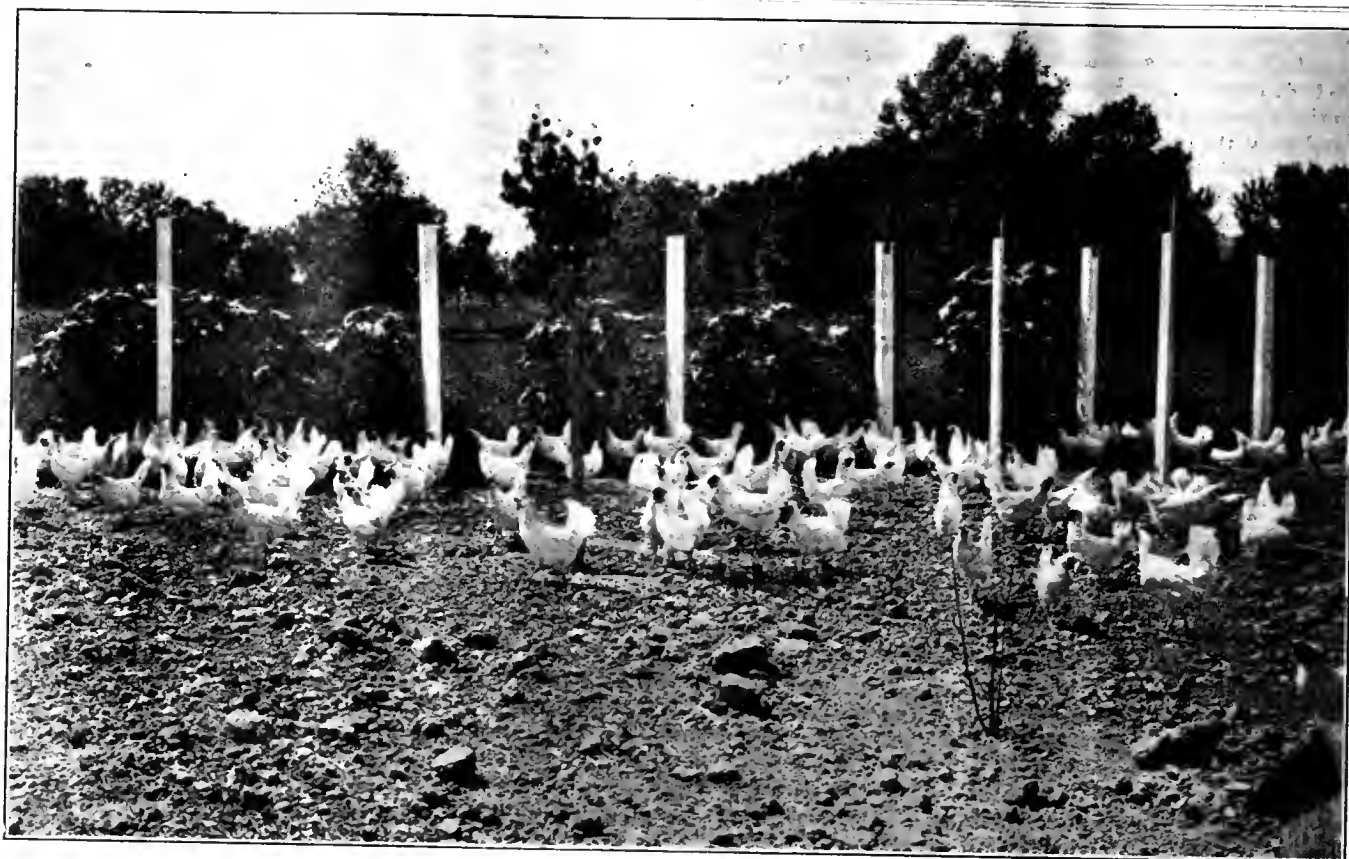
Apples .....	\$100,000
Pears .....	25,000
Wheat .....	50,000
Forage crops .....	35,000
Oats and barley .....	20,000
Grapes .....	220,000
Corn .....	100,000
Sweet potatoes .....	50,000
Peaches .....	10,000
Spinach .....	25,000
Beans .....	15,000
Asparagus .....	14,000
Chili .....	12,000
Radishes .....	4,000
Cabbage .....	14,000
Onions .....	20,000
Other truck crops .....	30,000

Total..... 7,844,000

In many cases the figures given above include only the value of products shipped outside the district and do not take into consideration products sold or consumed at home. Figures are not available on the returns from many smaller crops, such as strawberries, blueberries, artichokes, rhubarb, Irish potatoes, watermelons, squash, apricots, quinces, and other fruits.



A 3-year-old pear orchard on the Rio Grande project, New Mexico-Texas



A money making side line on the Rio Grande project, New Mexico-Texas

## LIMIT OF IRRIGATED AREA IN CALIFORNIA

The value of soil products in California in 1924 was approximately \$450,000,000. This included the production of both irrigated and unirrigated land and included 6,000,000 acres of the former. Although agriculturists have thus far skimmed the cream of the land that may be used for irrigation there is an ultimate limit to the total amount of land in the State for which there will be sufficient irrigation water. Various estimates place this total area from 12 to 18 million acres, which it is estimated should produce a crop worth at present price levels about one billion dollars. The development of water for irrigation purposes is becoming increasingly expensive and the cost of development per acre is already so high that it is usually feasible to develop only in comparatively large tracts—a fact which is believed to increase the probability that either State or Federal aid will be needed in much of the development work yet to be done.—Engineering News-Record.

Potatoes are a decidedly smaller acreage than last year and promise a smaller yield, but nevertheless may make more money for producers.

## YAKIMA PROJECT FRUIT TOPS FOREIGN MARKET

*Recent press dispatches state that J. MacPhee Ferguson, of Yakima, Wash., recently topped the Scotland apple market with a carload of wine-sap apples harvested in 1924. Despite the fact that the apples were nearly a year old and had been shipped 8,000 miles by rail and water, they arrived in first-class condition and brought prices four times more than this year's crop of Portuguese apples and higher than the 1925 crop of Australian and New Zealand apples.*

## THE WATER SUPPLY OF THE PROJECTS

An unusual amount of summer rains throughout the West has improved water supply conditions so that there is now no apparent danger of further shortage of water on any project excepting only the Okanogan project, and conditions there are much improved over those of 1924. Carlsbad project will have an ample supply for the rest of the season, although it suffered considerable damage from a scanty supply prior to July.

## RECLAMATION FUND HELPED BY SALES

The reclamation fund was increased \$158,429.53 through receipts from the sale of public lands including fees and commissions for the quarter ended June 30, 1925, the Interior Department announced to-day.

A list of the States with proceeds from the sale of public lands credited to the reclamation fund follows:

Arizona.....	\$12, 025. 49
California.....	22, 500. 79
Colorado.....	17, 889. 11
Idaho.....	9, 923. 88
Kansas.....	34. 24
Montana.....	13, 489. 40
Nebraska.....	4, 668. 12
Nevada.....	5, 917. 21
New Mexico.....	19, 756. 41
North Dakota.....	581. 27
Oklahoma.....	1, 024. 74
Oregon.....	12, 501. 45
South Dakota.....	2, 559. 81
Utah.....	8, 178. 19
Washington.....	4, 463. 36
Wyoming.....	22, 916. 06

The terms of the reclamation law passed in 1902 provide that a part of the proceeds from the sale of public lands shall be credited to the reclamation fund for the construction and maintenance of irrigation projects by the Government.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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Board of Survey and Adjustments

Thomas E. Campbell, Chairman Southern Division

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Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....		Brooks Fullerton.....	Mitchell, Nebr.
Boise.....	Boise, Idaho.....	J. B. Bond.....	E. R. Mills.....	C. F. Weinkauff.....	B. E. Stoutemyer.....	Boise, Idaho.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	V. L. Minter.....	V. L. Minter.....	Ottamar Hamels.....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantia, Mont.....	A. R. McGinness.....	J. P. Siebeneicher.....	M. M. Wilson.....	E. E. Roddis.....	Billings, Mont.
King Hill.....	King Hill, Idaho.....	G. H. Harris.....	E. V. Hillius.....	E. V. Hillius.....	B. E. Stoutemyer.....	Boise, Idaho.
Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	H. C. Melaas.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppeleman.....		E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	G. E. Stratton.....	E. E. Chabot.....	G. S. Moore.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	E. C. Diehl.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Newlands.....	Fallon, Nev.....	J. F. Richardson.....	G. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	H. W. Bashore.....	L. H. Moog.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Fuok.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weher.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	Ottamar Hamels.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	V. E. Hubbell.....	Brooks Fullerton.....	Mitchell, Nebr.
Salt River <sup>1</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>1</sup> .....				
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	H. R. Pasewalk.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	G. C. Patterson.....	C. M. Vogan.....	H. L. Holgate.....	Portland, Oreg.
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Williston.....	Williston, N. Dak.....	W. S. Arthur.....	W. S. Arthur.....		E. E. Roddis.....	Billings, Mont.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	H. L. Holgate.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho.....	F. A. Banks <sup>1</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo.....	F. F. Smith <sup>1</sup> .....	Chas. Klingman.....	T. R. Pacl.....	Brooks Fullerton.....	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Oreg.....	R. M. Conner <sup>1</sup> ..... Ralph Lowry <sup>1</sup> .	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.

<sup>1</sup> Project operated by Salt River Valley Water Users' Association

<sup>2</sup> General Superintendent and Chief Engineer.  
<sup>3</sup> Resident Engineer.

<sup>4</sup> Construction Engineer.

The NEW RECLAMATION ERA is issued every month by the Bureau of Reclamation of the Department of the Interior, Washington, D. C. It is printed by the Government Printing Office, Washington, D. C.

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*THE relaxation in collections by the Government during the period of extreme depression was justified, although it went much further than was permitted by private enterprises as a rule, but now, with the appearance of better times, we must return to the practices that prevailed a few years ago. This means increased payments, and of course it is more difficult for the Government to secure these than it would be for private management to do so. We find, however, that the objections to payments are not universal; they are due to the influence of relatively few. Justice to those who do pay, and the good repute of reclamation render it necessary that we do some things that are not pleasant to us.*

*Moratoriums exert an evil influence. They permit the inefficient to relax. They encourage resistance to payments. They do not develop earning power. A study of all past moratoriums proves this.*

*ELWOOD MEAD,  
Commissioner, Bureau of Reclamation.*

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# NEW RECLAMATION ERA

VOL. 16

OCTOBER, 1925

NO. 10



HERDS OF PURE-BRED DAIRY CATTLE INDICATE PROSPEROUS CONDITIONS



## FEASIBILITY

*FEASIBILITY* means "fit to be used or dealt with successfully." When applied to Federal reclamation of arid lands it refers both to the project's physical features and its economic promise.

*The project surface may be so rough that the cost of leveling may be prohibitive, so steep that water will not lie on it, or so depressed that it can not be drained. Irrigation under either of these conditions is not feasible.*

*The soil must be fertile, and the growing season long enough to mature profitable crops.*

*The relation between the estimated cost of supplying water and the returns which can be had from its use in irrigation likewise affect feasibility. The value of the crop should pay production expenses, give an adequate reward for labor, and in addition pay for the reclamation works.*

*The time required to return funds advanced by the Government in the improvement of lands is also an essential factor in determining feasibility. The investment should be repaid in a reasonable time. This in Federal reclamation should not exceed 40 years.*

*The cost of land, expenses of improving and equipping farms, availability of stable markets and fair prices, and the health and social conditions of the locality affect the economic opportunities and contentment of the irrigator and his family, and are therefore features of feasibility.*

*And finally, suitable settlers must be found for the project; otherwise it will not prove to be feasible under any circumstances.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

OCTOBER, 1925

No. 10

## HIGH LIGHTS IN A REVIEW OF THE MONTH

**T**HE Orland project, California, voted overwhelmingly for the construction of the Stony Gorge reservoir to increase the water supply on the project. Of the 796 ballots issued, 687 were returned. Of these, 660 were in favor of the work, 25 against, and 2 ballots were rejected. Of the 25 negative ballots all but 2 were cast by nonresident land owners, indicating an almost universal sentiment among resident property owners in favor of the proposed reservoir.

**S**IGNED by more than 600 water users and representing 35,000 acres of land under the Boise project, Idaho, petitions have been filed with the county commissioners requesting the calling of an election to vote upon the proposal to organize the lands of the project into an irrigation district. The proposed district will include all of the lands in Canyon County not now within irrigation districts already formed.

**A**CCORDING to a memorandum decision handed down by Federal Judge F. S. Dietrich in connection with the payment of drainage charges on the Boise project, Idaho, Government officials may shut off water to settlers who are delinquent in their payments.

**P**LANs are under way for the organization of a finance corporation, patterned after the Montana Livestock Loan Corporation, to give aid to responsible farmers on the Sun River project, Montana. It is believed that a capital of \$50,000 will be ample. Operations will probably be carried on through the medium of the intermediate credit bank.

**S**HIPMENTS of fruit and other agricultural products from the Yakima Valley, Wash., up to August 28 comprised 3,899 cars as compared with 2,104 cars for the season of 1924, or an

increase of 1,795 cars. The value of products shipped from the valley during the first 28 days of August was \$3,800,000 on board cars. Of this amount 981 mixed car lots of fruit were valued at \$1,470,000; 575 cars of peaches at \$632,000; and 430 cars of grain at \$516,000.

**A**BOUT \$3,000,000 was added to the wealth of the country by the Salt River Valley's 1925 cantaloupe crop. This came from an area of only 5,600 acres, giving a gross return of about \$550 per acre.

**T**WO tons of butter leave the Yakima post office via parcel post every day, according to the Yakima Valley Progress. There is also a weekly average of 2,000 boxes of fruit and vegetables. The butter is frozen hard for shipment before leaving the creameries, and is immediately transferred from the post office to a storage car, packed for shipment in 70-pound lots. Valley brands are fast becoming well and favorably known on the coast.

**L**OCAL automobile dealers on the Yakima project were jubilant over the business prospects for the coming season, and reported August sales 100 per cent above those of the same period last year.

**T**HE early potato harvest on the Grand Valley project had been completed with very satisfactory returns, the price holding at about \$2 per hundredweight. About 400 cars of peaches had been shipped from the Palisade district. Prices were satisfactory and many growers received more than \$1,000 an acre.

**O**N the Milk River project the second cutting of alfalfa had been completed. There will be a considerable acreage in alfalfa seed this year. Beet fields were in excellent condition and sugar

company officials were well satisfied with the prospects for this crop.

**T**HRESHING of small grain on the Belle Fourche project was about 80 per cent completed, and returns were fully up to expectations. Corn made fine progress, and sugar beets promised a bumper yield. Additional tanks were being erected to take care of the large cucumber pickle crop. This industry gives excellent promise of providing ready cash and large returns on a small acreage.

**E**ARLY potatoes were being harvested on the Shoshone project, and the first 10 earloads brought the growers \$1.75 per hundredweight. Yields were excellent and growers of this crop had the best season since the war. Returns on small grains were better than at any time since 1919.

**A**T American Falls Dam concreting on the gate section within the present cofferdam was completed to elevation 4,300 and work was begun on the left penstock section. The steel gate frames for the left penstock openings were placed. Excavation continued for the core wall of the right embankment and on placing and rolling embankment material.

**A**T Guernsey Dam excavation of the diversion tunnel continued for 219 linear feet, the total excavation amounting to 4,483 cubic yards. Work was continued on the trenches for the cut-off walls and on the north side spillway.

**A**T McKay Dam excavation of rock from the spillway channel and for the spillway gate structures was continued. One hundred and thirty-two thousand cubic yards of gravel embankment were placed at a unit cost of 50 cents, the total to the end of the month amounting to 1,960,000 cubic yards at a unit cost of 42 cents.

## SECRETARY AND COMMISSIONER GET FIRST-HAND DATA

*Extended visit affords personal knowledge of economic conditions on projects where works are being built to reclaim new areas and where appropriations have been made for beginning such works*

(Continued from September Issue)

ON July 10 the merits of the Owyhee project were presented at a morning meeting in Ontario. The leading feature was a clear statement of the situation from the local standpoint by E. C. Van Petten. Some of the facts presented in Mr. Van Petten's paper are printed in this issue.

The meeting at Ontario had to be brief because of a promise made to Senator Gooding and Congressman French of Idaho that an inspection would be made of the Washington irrigation district near Weiser. The irrigation works of this district were built from the proceeds of two sales of district bonds. Payment of interest on the district's debt is in default and money is needed to pay operating expenses and make improvements. The bureau is asked to take over the project, assume its debts, and reconstruct. The conclusion was that this could not be considered at this time.

A partial inspection of the Owyhee lands was made in the afternoon of July 10, on the way to Boise, Idaho. These lands are similar in character to those of the Boise-Payette area now under irrigation. The crops seen from the road from Notus through Caldwell and into Boise were uniformly good, nothing better in the way of ordinary farm crops having been seen in a 10,000-mile inspection. Only one conclusion could be reached from an inspection of these crops which is that the Boise area is an agricultural success. The explanation of its financial difficulties must be sought outside the operation of the irrigation works or the cultivation of farms.

The visit to Boise had not been planned. Time was made for it by shortening the inspection at Vale and Owyhee. It was made to enable the Secretary to confer with Senators, Congressmen, and local officers of the Boise project and representatives of water users regarding a controversy which had arisen over the collection of drainage charges more than a year overdue.

To understand this controversy, it is necessary to understand something of the evolution of this project and the complicated arrangements made with various groups of water users. Much of the land of this project was first irrigated from private works. They did not have a full water supply. To provide this a reservoir was needed, and this the Reclamation Bureau built. Then it sold water to some

canals under Warren Act contracts. It bought, enlarged, and extended other canals and built new ones for areas outside the original works. Out of these contracts have come different construction charges and some litigation with water users. There has also from time to time been strong antagonism between different groups of water users. These influences made the administration of this project somewhat difficult and the desire of those in charge has been to transfer its operation to the water users, but thus far no agreement satisfactory to all the interests has been reached.

Up to 1917 the project had paid practically all the Government's charges but in recent years the burden of private debts, low prices for crops, and an agitation for postponement or repudiation of irrigation charges have combined to create a critical financial situation.

Starting with practically no debt in 1919, the project's debt for the years 1920 to 1924 has risen to the staggering total of \$1,675,600.

To check this drift toward insolvency, notice was given in February, 1925, that no further blanket moratoriums would be granted, but relief would be granted where individuals could show they were entitled to sympathetic consideration.

Owing to relief extended in 1924 under the Phipps Act the construction and operation charges for 1924, amounting to \$857,375, were deferred and no effort was made to collect these. But \$72,916 which was due for drainage work done for irrigators by the Government more than a year before was over a year in arrears. Payment of this was requested. Water users were informed that these payments could be made in five installments beginning July 1 and concluding November 1. The amounts due from individual water users were small but this did not prevent an appeal. One individual owing only \$7.50 or five payments of \$1.50 each, filed a formal statement of inability to pay. We were convinced that this condition did not exist and in June the order was reluctantly given to shut off water from those who failed to pay the first installment of this charge by July 1.

Before that date more than 2,700 out of 3,000 water users had paid the first installment but those who opposed, secured a temporary injunction and arrested the project superintendent.

There was a question whether certain provisions of the Idaho State law did not

restrict the reclamation bureau from shutting off water from delinquents. If it did then all payments would hereafter have to be made in advance. The court subsequently ruled that the bureau's action was legal and practically all payments have been made.

The conference at Boise resulted in a statement by the Secretary asserting that it was the desire of the department to turn this project over to local control and outlining the procedure for doing this. His statement follows:

"In order that the settlers on the Boise project may have a definite understanding of what is needed in the way of organization to enable the settlers to take over the operation of the Boise project and secure the benefits of the fact finders' act, the people of the Boise project are advised that the department has decided on the following policy:

"(1) That a contract will be negotiated with the Nampa and Meridian irrigation district along the line of the contract heretofore submitted, which will grant relief of the following kinds:

"(a) The contract will provide for future construction payments on the basis of 5 per cent of the average gross acre income as determined by the Secretary of the Interior.

"(b) Provision will be made under which a suspension of construction payments for one year may be permitted in deserving cases where found to be absolutely necessary, but no blanket moratorium will be granted.

"(2) A similar contract will be approved with the Black Canyon irrigation district covering the lands under the Notus Canal.

"(3) If the lands of the Arrowrock division not now included in irrigation districts shall be organized as an irrigation district and the organization of the district confirmed by decree of court not later than April 1, 1926, a contract similar to the one with the Nampa and Meridian irrigation district will be authorized with the new district, providing the terms of payment outlined above.

"(4) Should such district not be organized by April 1, 1926, the board of directors of the Nampa and Meridian Irrigation district will be requested to permit the land owners of the unorganized part of the Arrowrock division, who may desire to do so, to petition their lands into the Nampa and Meridian

irrigation district, and the lands petitioned into the district will then be given the same terms applicable to the project lands now included in the district.

"(5) Under no condition will any contract be made with the Payette-Boise Water Users' Association, or with either of the two boards of that organization.

"(6) Land owners who insist on keeping their lands out of a district organization will be regarded as satisfied with their existing contracts and will be expected to meet them.

"(7) There will be no change in the ruling heretofore made in regard to the payment of drainage charges. The present ruling permits payment of these charges in five monthly installments. In the great majority of cases the payment now required in order to secure water is less than \$20, and in many cases less than \$10. If there is any land owner who has no other means of payment, or no credit, a few days' work for wages will produce the amount needed to pay this charge.

"(8) It is expected that foreclosure suits will be filed in cases where it appears that water users are able to make the required payment, but are refusing to do so.

"(9) The litigation recently initiated by the arrest of the Government officers for performance of their duties in carrying out the provisions of the Federal law, and also the civil suits started, will be carried to final judgment in the courts. The Government's officials will abide by the final decision of the courts, of course,

and the parties who have instigated the litigation will also be required to do likewise."

From Boise the party went to American Falls where on July 13, 20,000 people saw Secretary Work lay the corner stone of the American Falls dam. Gov. C. C. Moore, Senator Gooding, Congressmen Smith and French, and Gov. George Dern, of Utah were in attendance and an important group of railway officials including C. C. Calvert, vice president of the Union Pacific and one of the old timers of the West, were present.

The laying of the corner stone was followed by an industrial pageant illustrating the spirit of Idaho rarely equaled in the West. Its most striking feature was a portrayal of Indian life by 600 members of the Bannock tribe.

In its economic and financial aspects the American Falls reservoir is the greatest achievement of Federal reclamation. It will, if present plans are carried out, regulate the flow of Snake River so that all its water can be used. It will make available 1,700,000 acre-feet of storage at a cost of only \$5 an acre-foot. The greater part of this water will go to land already irrigated but which often suffers from drouth because of the wide variation in the unregulated flow of the river. It will practically double the value of the farms of irrigators whose water supply has been uncertain.

These facts alone make this a notable project but they are not its chief claim to

distinction. For that we must inquire into the way it has been financed.

When it was before Congress Mr. Cramton, chairman of the Subcommittee on Appropriations, inserted a requirement that private projects desiring an interest in this storage should pay for their respective shares in advance. This is being done. The money is being raised by the sale of district bonds. It is the strongest evidence which could be given of the solid value of this feature of the Minidoka project.

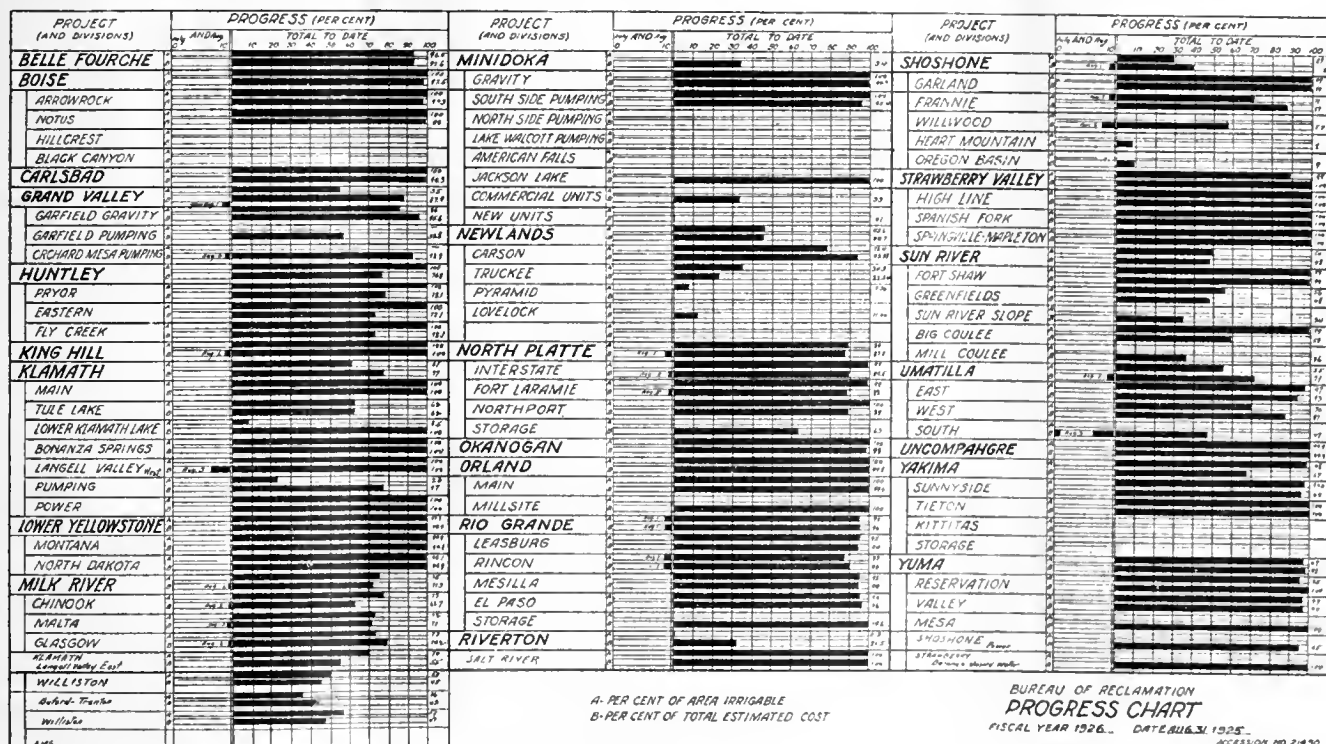
The following parties have contributed the sums named to the cost of this storage:

American Falls reservoir district	Amount
district	\$2, 012, 466. 42
New Sweden irrigation district	127, 500. 00
Ssnake River Valley irrigation district	102, 000. 00
Milner Low Lift irrigation district	152, 000. 00
Hillsdale irrigation district	150, 000. 00
	2, 543, 966. 42

The Empire irrigation district has subscribed but has not yet been able to provide its contribution of \$442,579.79.

The arrangements for the American Falls ceremony were in charge of a celebration committee of which R. E. Shepherd, of Jerome, was chairman. Mr. Shepherd has been the money getter of this project.

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## REGULATIONS TO GOVERN THE SELECTION OF SETTLERS

*Haphazard methods, under which any citizen who had not exhausted his homestead right, give way to careful selection on the basis of industry, experience, character, and capital*

**R**EGULATIONS for the selection of settlers on Federal irrigation projects in accordance with the terms of subsection C of the act of December 5, 1924, were approved on September 12 by the Secretary of the Interior. The regulations are as follows:

Subsection C of the act referred to is as follows:

"That the Secretary is hereby authorized, under regulations to be promulgated by him, to require of each applicant including preference right ex-service men for entry to public lands on a project, such qualifications as to industry, experience, character, and capital as in his opinion are necessary to give reasonable assurance of success by the prospective settler. The Secretary is authorized to appoint boards in part composed of private citizens, to assist in determining such qualifications."

Hereafter no entry for public lands within a Federal irrigation project shall be accepted by the local land office until the applicant therefor has satisfied an examining board, to be appointed on each project to consider such matters, that he is possessed of such qualifications (in addition to the qualifications required under the homestead laws) as to industry, experience, character, and capital, as in the opinion of the board are necessary to give reasonable assurance of success by the prospective settler.

Each applicant for entry of such public lands, including preference right ex-service men, and successful contestants under the act of May 14, 1880 (21 Stat. 140), shall file an application with the

Bureau of Reclamation which, among other things, must state with respect to the applicant, his or her age, status as to citizenship, whether married or single, number of children, and their sex and ages, other dependents, ownership of farm lands elsewhere and the value thereof, farming experience, assets and liabilities, and give references as to character and industry. The application may state the particular farm unit desired and may also include a second and third choice and, when practicable, the choice of a fully qualified applicant will be approved. However, the intent of the law is to select the best qualified applicants for all farms available and the Government must therefore reserve the right to distribute the farms to those best qualified, regardless of individual preferences.

Applicant must possess good health and vigor and have had at least two years actual experience in farm work and farm practice. The applicant must have at least \$2,000 in money, free of liability, or the equivalent thereof in livestock, farming equipment or other assets deemed by the examining board to be as useful to the said applicant as money.

The above minimum requirement as to capital and experience shall not apply when the farm (fractional farm unit) applied for is 10 acres or less in area and the applicant can show to the satisfaction of the examining board that the development of the farm is feasible from the capital the applicant may reasonably be expected to obtain as a wage earner.

An examining board of three members or more shall be appointed on each project by the Secretary of the Interior, or such officer as he shall authorize to make such appointments, to consider the fitness of applicants to undertake the development and operation of a farm. The members of such board shall serve for a period of one year, or until their successors are appointed, unless otherwise ordered by the secretary or such officer as he shall authorize to make such appointments. Each superintendent is requested to submit recommendations for membership on the board of examiners for his project at the earliest practical date.

A member representing the Bureau of Reclamation shall keep the records of the board and notify applicants when and where the board shall meet to deal with applications, in order that applicants may personally submit additional information as to their fitness for the undertaking.

The examining board shall note the date

of receipt by it of each application filed, and interview the applicants who appear before it, to determine the qualifications of prospective settlers. Careful investigation shall be made to verify statements and presentations made by applicants to the end that no misunderstanding may prevail either as to the applicant's fitness or his appreciation of the problems before him.

After decision by the board its conclusion, if adverse to the applicant, shall be reduced to writing and a copy thereof forwarded to the applicant by registered mail. Evidence of service of such notice shall consist of registry return receipt signed by the applicant, or his agent, or registered letter addressed to applicant at his record address and returned unclaimed. The board's decision as to the relative qualification of each applicant, based upon a percentage rating of the elements of industry, experience, character and capital, shall be final unless appeal from such decision be made to the Secretary of the Interior within 30 days from receipt of notice, and such appeal should be filed in the project office where the lands are situated.

The relative standing of applicants will be based upon a percentage rating, determined as follows:

Each of the elements of industry, experience, character, and capital will be considered as having a possible weight of 25 per cent, and applicants will be rated according to the following scale:

Industry:	Per cent
Fair.....	5
Good.....	15
Excellent.....	25
Farm experience:	
2 years or more in East.....	15
2 years or more in irrigation.....	25
Character:	
Fair.....	5
Good.....	15
Excellent.....	25
Capital:	
\$2,000.....	15
\$3,000.....	20
\$5,000.....	25

Approval by the board of an application, followed by the filing of water right or water rental application, when either is provided for on the particular project involved, which feature the board shall cover by appropriate notation on the application, will entitle the applicant to file homestead application at the designated local land office for the farm unit assigned to him. Such homestead application shall be made within 15 days from

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### SECRETARY GETS FIRST-HAND DATA

(Continued from page 147)

The arrangements made for the inspection at every project visited were complete and satisfactory. They showed the zeal, interest, and efficiency of the project officials. It was an evidence not alone of fitness for their task but of a high morale. This added duty fell on men already burdened with daily duties of an exacting character. A change in plans made it necessary for Superintendent Bond to drive his car all night to meet the party and all the next day to travel with it.

The conclusion is that farmers on reclamation projects will have larger rewards for their labors this year than in any year since the collapse of war prices. It affords the opportunity to put the finances of the old projects on the basis of paying as we go.



## AGRICULTURAL COOPERATION MEANS MUTUAL HELPFULNESS

*Those who are studying the problems of cooperative organization believe that cooperation among farmers for the proper conduct of their business holds promise of helpfulness to all the people*

*By J. C. Gilbert, specialist in market news and radio, Department of Agriculture*

**T**HE word "co-op-eration" is just a jumble of letters which means mutual helpfulness, team work, pulling together. It means doing in an organized way for many what happens every day when two or more people work together to accomplish a common end. Eight oarsmen in a racing shell must cooperate efficiently to win a race, but let one oarsman falter or break time and the result is confusion and the efforts of the others amount to little.

Agricultural cooperation is this idea of team work and mutual helpfulness applied to the many problems of the people who live and work on farms.

It is not necessary to tell the farmers who are members of the fruit growers' associations what cooperation means; they are practicing it, living it every day. But there are a lot of folks even in the country as well as in towns who know very little about organized cooperation among farmers. The purpose then of this article is to tell a little something about this farmer cooperation and what, when rightly applied, it may be able to accomplish for all of us in the marketing of farm products.

One of the Department of Agriculture exhibits that has been widely shown is called the "Bridge of Cooperation." On the left of the exhibit is shown a picture of the country, with farm yards and pastures, with cattle and sheep and hogs, and waving fields of grain—in short, the source of supply. On the other side is shown the city, with its rushing thousands of workers who must be fed and clothed. This represents demand. In between the two, "Supply" and "Demand," is a

beautiful bridge strongly built and of lasting materials. The giant foundation stones of the bridge are the principles of honesty and business integrity. The keystone is mutual confidence without which there can be no cooperation.

Cooperation is largely dependent upon these ideals as objectives. Why make the effort to organize for team work if greater efficiency is not to be striven for and also if group action can not make for economies and savings, even though only in the long run; why attempt to cooperate?

Most agricultural cooperative effort in this country has been applied to the problems of marketing farm products. It is impossible to understand cooperative marketing unless one knows the background. This means that we must understand what is meant by marketing agricultural products. Just what is marketing? "It is the doing of the necessary things that make it possible for the consumer to have and use the products of the farm." It is service rendered. Some is performed by the farmers, and some by the dealers or those commonly called middlemen. These services consist of many items among which are assembling and standardizing. This latter includes grading and packing for shipment. Then come transportation, storing, financing, and distributing. Only in a few cases have farmers fully realized the commercial value of a standardized product. How then shall they arrive at the happy time when they can see their products sold as manufactured articles are sold, one sale securing repeat orders, and each satisfied customer coming back for more and know-

ing just what to ask for? Can the farmers attain this end themselves or shall government step in and tell them by laws just what and where and when to market their goods?

It is possible for the farmer to work out his own problems. He can and is doing it.

Successful marketing includes more than standardization. It includes the use of efficient methods by which products are made available at the time and place of greatest demand. How many of us could tell where and when the greatest demand would be for sweet potatoes? Some folks claim that you can't foretell what the future will be; therefore it is impossible to develop a program and follow it successfully. The answer to that is to study what the California Fruit Growers Exchange or the American Cranberry Exchange has done in distributing its crops throughout the shipping season and into every available consuming center. There is hardly a turkey in the country but will be served this fall with an accompanying dish of cranberry sauce. It just must be, and it is possible because the cranberry growers themselves have applied business methods to their marketing.

"Now, just where does cooperation come in?" someone says. How does it make for efficiency, or economy, and who gets the benefits? These are simple enough questions, but they are not so easy to explain clearly and definitely, for many benefits to be derived from any method are often intangible and distributed over a long time.

The first cooperative associations developed around local shipping points. This was a logical starting point. Ten or fifty people with common marketing problems worked together to meet their problems. Cooperation could not very well begin with ten or a dozen men here and as many somewhere else, or between 1,000 men scattered over a large territory. Cooperation comes from contact. It develops from problems that you can not solve as individuals, but may hope to solve collectively.

If cooperation does not succeed on a small scale, it can not be expected to succeed on a large scale. If 50 farmers can not cooperate in their own community to accomplish some purpose, it would be useless for these 50 men to become a part of a group made up of several thousand men

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## THE SELECTION OF SETTLERS

(Continued from page 148)

the date of approval of the application, except in those cases where a preference right is being exercised, in which event the period provided by law for the exercise of the preference right shall control. Failure to so make such homestead application will entitle the board to approve another application for the same unit, allowing the applicant to make homestead entry; this procedure continuing, if necessary, until an approved applicant makes a homestead entry.

The above regulations relate in the main to the entry of vacant farm units upon existing projects and existing divisions thereof, and while suggestive of the procedure to be followed in the opening of new projects or new divisions, each public notice or order opening new projects or new divisions will contain detailed instructions on the subject of the qualifications necessary for prospective entrymen and the procedure under which such qualifications will be determined.

## COOPERATION IS A DEVELOPMENT FROM WITHIN

*The cooperative association must perform the marketing functions more economically or better than these functions are now being performed or the association can not expect to continue its operations*

(Continued from page 149)

and hope to become good cooperators. If farmers who are thinking about organizing an association can not solve their local mutual problems among themselves, they could hardly expect to be successful as a part of a large organization.

Cooperation is a development from within. The spirit of cooperation can not successfully be forced upon farmers from the outside in the hope that they will catch the fever. If the spirit of mutual helpfulness is already manifest in a community, then an organization, either local or as a part of a larger one, has a chance to succeed.

A cooperative association, in addition to the spirit of working together, must have a purpose—a reason for being. "Cooperative marketing is a positive agent to perform a function. It is not, therefore, simply an end unto itself." There it is in a nut shell. There must be a reason for every cooperative organization. Either the marketing is not being done at all, is not being done satisfactorily, or is not returning a fair price to the producer.

Many enthusiastic promoters of cooperation state with great fervor and emphasis that farmers should always organize and that all farmers should be included in the organization. Such a promoter is working for himself, and not for the good of the farmer or of the consumer, or anyone. Usually he gets so much a head for members, the more the better for him.

Cooperation is not a panacea for all marketing ills and there is no magic or mysticism about it. Business principles that apply to merchandising in steel, lumber, oil or groceries, apply equally well to merchandising farm products through cooperative associations. Cooperative marketing is not a ready-made garment that can be bought ready to put on. In a practical sense it is rather a development of an idea and its success will depend largely on how completely the idea has been developed in the minds of the farmers comprising the organization. This idea is that the cooperative association must perform the marketing functions more economically or better than these functions are now being performed or the association can not expect to continue its operations. There must be, in other words, the necessity for the organization.

Many times unscrupulous organizers have formed associations of farmers and have brought dishonor on legitimate efforts by forcing an organization when

none was needed. Then again, failure after failure of sincere efforts by honest farmers has been due to lack of business ability on the part of the managers chosen. Honesty is not enough. Good products alone will not spell success. Business principles must be applied to farmer cooperative effort or it is handicapped from the start.

Many different purposes have prompted farmers to cooperate, but the purpose usually associated with the idea of cooperation is that of marketing one or a few products. It may be a fruit exchange marketing one or several kinds of fruit, a livestock shipping association handling cattle, sheep and hogs, a tobacco, a peanut, or a cotton cooperative. Usually the organization is formed on a commodity basis.

If the organization grows into a federation of a number of local units under one sales management, these often develop tendencies that make for success or failure.

Bigness in a cooperative is not a measure of success any more than an excessively

fat man can always be said to be having a better time than a thin man because he takes up more room.

One of the big problems in agriculture to-day is to produce intelligently. The consumer dictates and his wants must be filled. American men wanted to shave themselves in their own homes along with washing their faces and hands. Straight razors were inconvenient in many ways—took too many slices off chins—so the manufacturers produced safety razors.

Big organizations intelligently directed that teach farmers to produce what the consumers want and that return to the farmers full market value for the grade of product shipped are needed as much in agriculture as in other business. Being needed they are developing and rendering service.

Large scale associations can secure economies by distributing the overhead expenses so that the cost of handling each unit is reduced. Of course not all have been successful. Blunders of manage-



Cantaloupes are a profitable crop on many of the projects

ment and losses have occurred. The possibilities are there and it is up to the farmers to see that the management knows its business. If the organization is big enough it can pay salaries that will attract men of ability as managers and salesmen.

It is no criticism to say not many farmers are good salesmen. Salesmanship requires special qualifications. The big cooperatives can get men who know how to sell. They can establish brands and have distinctive labels and packages. These things have a distinct value in the market.

There are weaknesses, however, in large organizations. One is the loss of personal contact which members have with the management. This is responsible for indifference on the part of members and in turn makes it possible for the management to control for its own ends that which should be controlled by the membership. Committees of members from localities not a part of management are useful in correcting this evil.

Another weakness of the big organizations is the possibility of too much emphasis being given to price control. The idea gets abroad that because of the largeness of the organization and its volume of business it should name the price of the commodities.

Price making or setting of a price is not in itself a process of marketing. With the fullest possible information as to supply and demand, present and future, available to both buyer and seller, the price agreed upon is the outgrowth of confidence in the facts known to both.

In many instances farmers have received all too little for the products of their land and toil. Some fundamental step in the process of marketing has been faulty. It may be due to lack of standardization or it may be due to lack of proper financing. Either of these factors may be remedied by organization, but the process of correcting such deficiencies is relatively slow and the remedy often requires some very definite action by the farmers themselves. Sometimes the remedy is unpleasant and means loss of pride as producers.

The elimination of the middleman is possible. All the intermediate steps in marketing can be performed by the association, but each step, each service, must be paid for no matter who does it. Whoever can do it best will be the one to do it. If the association chooses to do more than assemble, standardize, grade, pack, and ship, it must accept the responsibility such action entails.

Bear this in mind, whether you are a farmer, dealer, or consumer: Every added function means added responsibility and possibility of a loss as well as a gain. Not

## SAM NESS, SUCCESSFUL WATER USER

*Greenfields division, Sun River project*

IT is always a matter of satisfaction to submit a report on water users who are making a success in their farming operations. Mr. Sam Ness is the owner of 160 acres of land in the Greenfields division of the Sun River project, Montana. He was one of the first farmers to make sweet clover one of the important crops on the irrigated farm and this year he has the following crops: Sweet clover, 35 acres; alfalfa, 10 acres; barley, 20 acres; oats, 10 acres; wheat, 50 acres.

He cuts his sweet-clover hay with a binder, leaves it in the shock until it is eured, and then stacks it. In this way every leaf is saved and the crop is more easily handled and is in better shape to feed. His stock does well on this sweet-clover hay and he gets good returns from his pasture.

Last spring he plowed about 30 acres that had been in sweet clover and put in a crop of wheat. He has threshed his wheat with the following returns: On  $6\frac{1}{2}$  acres he had a yield of 52 bushels per acre, and on 20 acres he got 35 bushels per acre. The wheat graded No. 1 hard, and weighed 63 pounds per bushel and only 5 per cent of white bellies. The difference in yield above noted is due to the fact that the small field was well irrigated, whereas the larger field that went 35 bushels did not receive all the water it should have had. The farm laterals were not properly laid out and it was difficult to handle the water. This trouble will be corrected before another year.

every dealer makes a fortune, nor do all the railroad and interurban freight lines pay fat dividends. Every bit of service rendered is worthy of its share of the ultimate sale price. A just and equitable division is what we all want to see.

If cooperative effort among farmers can make for better products, more uniformly packed and graded, enabling transportation to be accomplished without loss and helping dealers to make an honest percentage of profit on the goods they handle, both the producer and the consumer will be benefited. It will then in truth be a bridge between supply and demand, and a blessing.

Those who are studying the problems of cooperative organization believe that cooperation among farmers for the proper conduct of their business holds promise of helpfulness to all the people.

A great deal has been said in recent years about the low grade of wheat that grows on irrigated land, but here we have a crop of wheat that takes the highest grade, and it was well irrigated. Mr. Ness had a small field of wheat where the land was in corn in 1924 and this wheat will grade about 25 cents per bushel less on account of the high percentage of yellow bellies. This seems to indicate that it is something to do with the condition of the soil rather than the application of water that makes the difference in color.

Mr. Ness has a field of sweet clover that will produce a fine crop of seed and a small patch of alfalfa that is heavy with seed and should give him a good return per acre. He is well pleased with the results this season and feels that he will make a still better showing in future years.

The average wheat crop on an irrigated farm has not, in recent years, been a profitable crop, and this will probably hold true on the Greenfields Bench this year, as the average yield will probably not exceed 12 bushels. And yet here is one farmer who, by improved methods and efficient use of water, has produced a crop that is over four times the estimated average. This project never will be a success under present methods of extensive wheat farming, but if we can induce some of the water users to profit by the experience of Mr. Ness there is hope of pulling things out of the rut and growing profitable crops. He hit the nail on the head when he said "We are trying to handle too much land."

## YAKIMA DAIRY COW SETS REAL RECORD

A record of 420.7 pounds of butter in a period of eight months has been made by a Guernsey owned by Dr. J. F. Scott, of the Yakima project, Washington. The Guernsey, at the time of the report, was leading all other cows in the Yakima County Cow Testing Association, having produced an average of over 52 pounds of butter a month, or nearly 2 pounds of butter a day.

The testing association is proving a profitable venture to dairymen in keeping them informed whether they can afford to keep their dairy cows. During August members of the association disposed of 14 cows because tests showed they were not being kept at a profit.

## EGG PRODUCTION AND PRICES MERIT CONSIDERATION

*The fall and winter months are the season that determines whether the poultry enterprise is yielding the best returns. Pullets that lay in the fall are the result of foresight to hatch early*

*Prepared for the Era by the Bureau of Animal Industry*

**B**EGINNING about the middle of August each year, the farm price of eggs begins to rise, reaching the crest about the middle of December. From then the price declines until the middle of April and remains low until August when the cycle described repeats itself. This general condition is well known. But the poultry raiser seldom realizes to what an extent the price of eggs, the production of eggs, and the time of hatching are related. He is usually surprised to learn that early-hatched and early-laying pullets produce more than twice as much income in a year as the same number of late-hatched and late-laying pullets.

### PRACTICAL POULTRY ARITHMETIC

The fall of the year when egg prices are rising is an excellent time to consider some practical poultry arithmetic. It is a good time to note how many of this year's pullets are laying and how many are not, and if possible to determine why. Poultry specialists of the United States Department of Agriculture have studied the question in detail and have announced some illuminating results. The time to prepare for a good production of fall eggs is in the early spring, for if hatching is delayed beyond the middle of May, even the greatest skill in management can not outweigh this handicap. A few weeks' difference in hatching time is enough to cause several months' difference in time of laying and 15 cents or more difference in the price received for eggs. The following deductions by Federal poultry specialists are offered for the consideration of flock owners:

One hundred early-hatched pullets will produce about 16,000 eggs in a year at a value of \$466.67.

One hundred late-hatched pullets will produce about 9,000 eggs in a year at a value of \$187.50.

Early hatching yields benefits at other seasons of the year, including early maturity, early laying, better prices, and larger profits.

The financial figures mentioned are based on the production of commercial flocks and average monthly farm prices of eggs for the period 1910 to 1924.

Besides the returns from egg production, similar benefits may be expected from the production of early broilers. Chickens hatched early usually will lay by about October 15 and will produce eggs during the four months of the year when egg prices are highest, averaging between 30 and 50 cents a dozen to producers. Late-hatched pullets, on the other hand, can not be expected to lay before the middle of February. They lay fewer eggs and the eggs bring a lower price. The dates mentioned apply to average climatic conditions; in the Southern States the hatching and laying schedule should be about two weeks earlier.

### FIGURES OF WIDE SIGNIFICANCE

In the figures mentioned may be found the explanation for wide differences in returns from poultry flocks. Generally with late hatching, growth is retarded by lice, mites, hot weather, and other conditions that cause heavy losses or unthriftness among small chicks. On the other hand, birds which get a good start during

April and May are developed enough to resist the unfavorable conditions mentioned with but slight discomfort and loss.

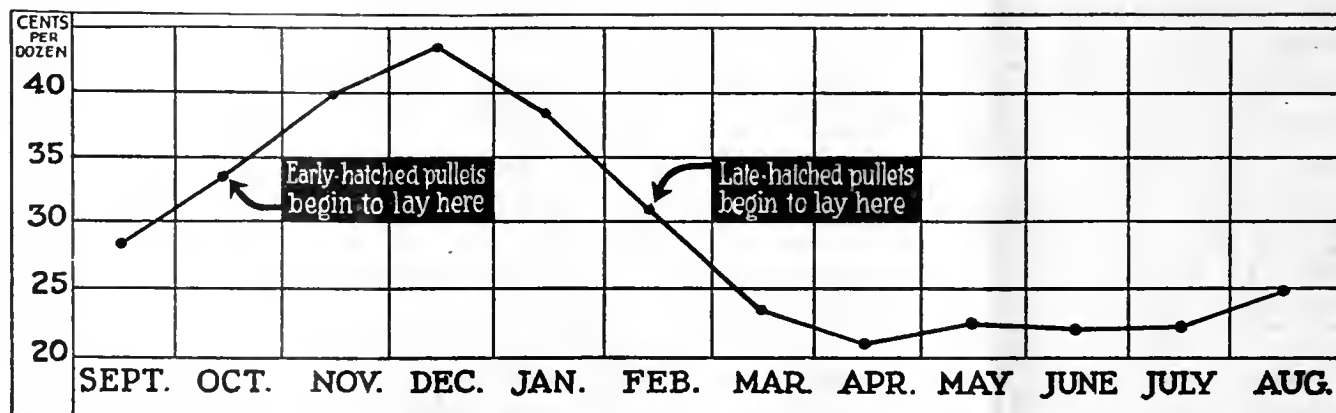
A fowl is a small livestock unit, of course, compared with other farm animals and on many premises is permitted to lay, sit, raise a brood, molt and shift for itself without much close attention. Such a method of management is fatal to best results with other livestock and can not be expected to yield the best returns with poultry.

The question of egg production and prices is important enough to merit studious consideration. The fall and winter months are the season that determines whether the poultry enterprise is yielding the best returns. If not, the late winter and early spring months are the time to correct the system of breeding and hatching so that another year will witness the profits which Federal poultry specialists assert are possible when correct methods are followed.

Government poultry literature is available to all who request it, including information on breeding, feeding, housing, incubation, brooding and general management. A staff of experts in the United States Department of Agriculture will also answer questions on special problems.

Heavy steers have been bringing higher prices than last year, hogs are nearly double the price of a year ago, and lambs have been higher priced.

Onions, cabbage, melons, and peaches have been selling at two or three times last year's prices and seemingly have a brisk fall market ahead.



Average monthly farm price of eggs, 1920 to 1924. The chart shows the close and important relation between returns from poultry flocks, time of hatching, and time of laying



## NEW PROJECTS AND THE OLD

**A**N economic factor in Federal reclamation, formerly left to be dealt with after works were built, is the speculative inflation of prices of privately-owned land included in new projects. The law now requires that where private land is held in excess of homestead areas, the price at which the surplus shall be sold to settlers must be fixed before construction begins. To carry out this wise precaution requires patience and time in reaching an agreement with private owners to whom any curb on speculation is at first regarded with disfavor.

Where land is in private ownership, owners are now required to organize a district. Payments due the Government will by this action be collected under the operation of State laws, and controversies with individuals which have too often arisen in the past will be averted. An agreement on the part of those assuming this responsibility is not always reached at once. Time is required to bring about unanimity of opinion and action.

Satisfactory progress in preparing for new development has been made since the passage of the last appropriation act. The cost of two units of the Salt Lake Basin project, to be first constructed, has been fixed, and the terms of payment agreed upon. A local committee of water users is at work organizing an association which will, as an association, purchase the water.

The Spanish Springs unit of the Newlands project is an extension of that project, using, in part, the same canal. Before construction can be undertaken, the size of the original unit of this project has to be fixed. This requires a careful soil survey, which has just been completed. It also requires the conclusion of a contract with the Reno Power Co. Negotiations to fix the terms of this contract are well advanced and it is believed that a satisfactory agreement will be reached. When this is done, an agreement with the State will be sought regarding aid by the State, or by private enterprise in the settlement and development of farms.

On the Kittitas project, in Washington, a district has been formed. The terms of the contract with the district have been agreed to. The soil survey is nearing completion as is the classification of land and fixing of prices for surplus land. Only one further step requires to be taken on this project before construction begins. This is a contract between the State of Washington and the Interior Depart-

ment under which the State will undertake to furnish aid to settlers in the development of their farms.

The State of Washington has not as yet indicated willingness to undertake this, but a private association has been formed which is willing to assume this responsibility. This would be entirely satisfactory to the department, but authority from Congress will be needed. Meantime, the thoroughness of the soil survey and land classification enables land owners, settlers, and the Government to understand conditions and obligations of each before construction begins.

There are three new projects in Oregon. Appropriations for the Baker project have been made by three different Congresses. Construction has been postponed because of misgiving as to whether settlers who have capital enough to develop farms can be secured under existing laws. All reports agree that aid in settlement and development is needed. No provision for extending this has been made.

The Vale project contemplates the purchase of a share of the water in the Warm Springs reservoir. A tentative contract for its purchase has been prepared and submitted to the Warm Springs irrigation district. The appropriation for this project requires that the State shall extend financial aid and practical advice in settlement when the works have been completed. Legislation by the State of Oregon will be necessary. The Governor has been asked whether he is prepared to recommend this legislation. No reply has as yet been received. Meantime, the

required economic investigations and negotiations for the necessary contracts are being continued.

The Owyhee project contemplates supplying water under Warren act contracts to a number of private irrigation districts. One of these districts has an inadequate water supply. In the others the water is being supplied by pumping, which is expensive. This project can supply it by gravity. A tentative contract has been submitted to the districts. A district will be formed for part of the project and a contract with it entered into. Soil and topographic surveys are being completed. Investigations to determine the suitability of the foundations for the dam, which will be one of the highest in the world, are nearing completion.

An appropriation for the reservoir and for enlarging the main canal of the Greenfields division of the Sun River project was made by the last Congress. This would add 57,000 acres to the irrigated area and give an adequate water supply to 43,000 acres in the existing project. The estimate of the cost has been completed. A contract with the holders of excess land, fixing the maximum price which will be charged settlers, has not been agreed to by water users. The appropriation requires the State to furnish aid in farm development after the works are built. The State of Montana does not feel able to undertake this responsibility, but a private corporation is being formed to provide this.

On the older projects a board of survey and adjustments has been dealing with those who claim relief under subsection K of the recent act. Its report will be submitted to Congress. The Division of Reclamation Economics has been conferring with the water users and others interested, with a view to settling lands not yet brought under cultivation, to improving agricultural practice and increasing the earning power of farms.

It is believed that some credit system which would enable farmers on old projects to refund their private debts and give them a longer time to pay and a lower rate of interest, should be put into operation.

In order to decentralize management and make settlers on projects more independent and self-reliant, an endeavor is being made to turn over to districts or associations the management of projects.

Standardization of farm products is rapidly attaining national and international importance. Federal grades are now available for 30 kinds of fruits and vegetables, one or more of which grades have been adopted by 25 States for use in intrastate as well as in interstate commerce.

### THE WATER SUPPLY OF THE PROJECTS

*The month of August was marked by an unusual amount of rainfall throughout the irrigated areas of the west. Threatened shortage on the Truckee lands of the Newlands project did not materialize, the natural flow of Truckee River being sufficient for irrigation without resort to pumping from Lahontan Reservoir. The only project experiencing a shortage is the Okanogan, and although the shortage there is serious, it is much less severe than for 1924. Complete information regarding Salt River project conditions are not at hand, but it appears that the situation is less serious than anticipated.*



## COLUMBIA BASIN SPECIAL COMMISSION MAKES REPORT

*Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, chairman, and Hon. John H. Edwards, Assistant Secretary of the Interior, believe that further information is needed before undertaking gigantic scheme*

**I**N a report submitted to Secretary of the Interior Work recently, a special commission on the proposed Columbia River Basin reclamation project declared that the time had not arrived when local and national interests required its construction.

The report points out that the cost of this project has been fixed at \$193,360,000, which is \$158 per acre and that the Bureau of Reclamation is not possessed of the information needed to formulate a development plan as costly and complex as the one outlined for the Columbia River Basin. The commission making the report comprised Dr. Elwood Mead, Commissioner of Reclamation, chairman, and John H. Edwards, Assistant Secretary of the Interior. The report in full follows:

The Sixty-seventh session of Congress authorized, by joint resolution, the appropriation of \$100,000 for an investigation of the feasibility of what is known as the Columbia Basin irrigation project, in the State of Washington. The appropriation was made under the act of Congress dated February 21, 1923 (42 Stat. 1540). The investigation carried out under that appropriation has been conducted through a commission appointed by you to look

after details. This commission now reports that the investigation has been completed, and transmits its findings herewith for your information in order that you may in your discretion cause the same, with your comments, to be reported through the President to Congress.

Prior to this appropriation the Columbia Basin project had been investigated by the State of Washington, which has expended \$150,000 on this work.

Mr. Homer J. Gault, for many years an engineer in the Reclamation Service was selected, with your approval, to conduct the work in the field; he made a thorough survey and investigation of the engineering problems of the project during 1923, being assisted by soil experts from the Department of Agriculture and representatives of the Geological Survey who made studies of the water resources and of geological conditions as related to the location of various features. Mr. Gault's report was submitted in March, 1924. In this he outlined the result of his field work, discussed various alternative plans, and included the findings of the soil, geological, and water experts. A summary of the two alternative projects submitted by him is contained in the following table:

*Comparison of gravity and pumping projects*

Plan	Gravity	Pumping
Irrigable area (acres).....	1,406,000	1,133,000
Estimated cost.....	\$325,340,790	\$279,310,420
Cost per acre.....	\$231.40	\$246.58
Interest on cost at 5 per cent.....	\$11.57	\$12.33
Operation and maintenance charges and depreciation.....	\$2.66	\$4.65
Sum of annual costs per acre.....	\$14.23	\$16.98
Commercial power at Grand Coulee (horsepower).....		1 545,000
Difference in power possibilities (horsepower).....		2 316,000

<sup>1</sup> Without storage.

<sup>2</sup> With storage for power.

In Mr. Gault's report he calls attention to his omission of the following economic features:

"There are a number of pertinent subjects that are not discussed in this report, some of which are:

- "(a) Restriction of speculation in land.
- "(b) Organization of irrigation district.
- "(c) Means of financing the project.
- "(d) Terms of repayment.
- "(e) Limitation of land ownership.
- "(f) Probable rate of settlement.
- "(g) Market for and value of power produced.
- "(h) Feasibility from the financial standpoint.



Cutting the third crop of alfalfa on the North Platte project, Nebraska-Wyoming

"(i) Demand for irrigated land.

"(j) Capital required by the farmer."

The report was reviewed by a board of engineers taken from the staff of the Bureau of Reclamation, the members being A. J. Wiley, James Munn, and J. L. Savage. Their report devotes itself largely to a discussion of the reasons for the large increase in the estimates in the Gault report over those of former reports prepared under the direction of the State of Washington. Their conclusion was that this arises from differences in the estimates as to carrying capacities of the canals, the quantity of water required, its losses in transits, and allowances for overhead expenditures and contingencies; and that the Gault report represents a fair estimate of cost under the conditions prevailing at that time.

On further consideration, it was decided, however, by your commission to have a further review of Mr. Gault's report, and an independent investigation of the project which would include, along with engineering features, the settlement and farm development problems. This was required to make this report conform to the recommendations of the Committee of Special Advisers on Reclamation. This board of review was therefore selected to include men who were not only eminent as construction engineers, but who were also familiar with the economic and agricultural aspects of reclamation. It was composed of six members: Louis C. Hill, of California; Charles H. Locher, of Maryland; Richard R. Lyman, of Utah;

Arthur J. Turner, O. L. Waller, and Joseph Jacobs, of Washington. The report of this board was submitted in February, 1925. It considered five different plans or schemes of development. The one favored embraces 1,224,000 acres which, with the exception of 170,000 acres of pumping lands, is to be irrigated by gravity, using the waters of the Pend Oreille and Spokane Rivers. The construction cost of the works is fixed at \$193,360,000, which is \$158 an acre. This estimate includes provision for drainage and contemplates the lining of canals to the border of each unit. The reduction in cost below that of the Gault estimate is accomplished principally by changes in engineering design, including—

(a) Utilizing return flow and lining all canals, thus reducing diversion requirements and effecting large saving in size and cost of main canal system.

(b) Readjustment of gradients of main canal, reducing cost of tunnels and siphons.

(c) Utilization of Spokane River with Coeur d'Alene storage as an auxiliary water supply.

An alternative plan which would use Priest Lake as a storage instead of Lake Coeur d'Alene is included in the engineer's report, the cost being slightly larger.

This report agrees with previous reports in regarding the project physically feasible; the land is fertile, the water supply adequate, and climatic conditions make possible large yields of general farm crops and a variety of orchard and garden products.

The outstanding feature of this report is the attention given to the agricultural and economic requirements of the project along the lines of the recommendation of your Committee of Special Advisers on Reclamation. Two of the board's economic conclusions contained the following recommendations:

"That the State should assume its proper share of responsibility for collecting payments from the settlers, and should also bear its proper share of the losses, if any, incident to the development of the project.

"That the Government should clear and level the land and provide a reasonable financial credit for necessary farm improvements. Also as a guarantee against land speculation, and to insure that the settler secures the land at its fair value; that the Government acquire title to all the irrigable land within the project."

Your commission has no doubt that the time will come when local and national interests will require the construction of these works, and the utilization of these immeasurably valuable resources. It does not believe, however, that this time has arrived; or that the Bureau of Reclamation is possessed of the information needed to formulate a development program as costly and complex as the one outlined and advocated in this report.

So far as construction is concerned the procedure of the past could be followed, but building these irrigation works would not of itself insure solvent development

(Continued on page 156)



Oats in shock, Lower Yellowstone project, Montana-North Dakota

## DANISH SMALL-HOLDINGS ACTS HELP HOME OWNERSHIP

*The small-holdings acts of Denmark, including selection of settlers and financial aid from the government, have changed that country from a land of tenant farmers to a land of home owners*

**S**LECTION of settlers on the basis of approved qualifications and capital and financial aid furnished to them to supplement inadequate capital are fundamental factors in virtually all successful schemes for planned rural development. These two factors have been recognized and put into practice for many years by numerous foreign countries in meeting problems of land development similar to those met by the Federal Government in its work of settling and developing the arid regions of the West.

One of the most outstanding examples of adequate selection of settlers and aided and directed settlement is the work which Denmark has been perfecting during the past 30 years. In this period, owing to the enactment of far-sighted legislation, Denmark has become a land of home owners instead of a country of tenant farmers. To-day more than 90 per cent of the people own the land which they farm. Here the small farms predominate. Of the 205,000 farms, approximately 100,000 average 50 acres in size, and another 100,000 about 20 acres.

In connection with the study now being made in the United States of the desirability of enacting legislation which shall provide for an adequate system of selection of settlers and aided and directed settlement during the early years of changing raw land into producing farms,

the following provisions of the Danish laws are of interest:

Under the act of April 3, 1924, the following persons may become small holders or acquire plots of land:

1. Persons whose principal means of existence is ordinary agricultural or horticultural labor, on behalf of other persons and for wages.

2. Rural workers assimilated to agricultural workers.

3. All those who live by agricultural work.

In addition, applicants must have the following qualifications:

1. They must be of Danish nationality.

2. They must be not less than 21 nor more than 60 years of age.

3. They must never have been sentenced by any court without having been rehabilitated.

4. They must never have received public charity which has not been remitted or repaid.

5. They must have done agricultural work for at least four years after having reached the age of 18.

6. They must be in such circumstances that they can not otherwise acquire land.

If an applicant fulfills these conditions he must present:

1. Certificates from two trustworthy persons who have knowledge of the applicant's circumstances and who testify that

he is sober and thrifty and is in a position to undertake the cultivation of the land.

2. A certificate from the municipal authorities of his place of residence declaring that he is fitted to become a small landowner.

The land selected by the prospective applicant must not exceed 21,000 crowns in value (1924-25), including the estimated value of the dwelling house, the livestock, and the moveables. The cost of of buildings must not exceed 11,000 crowns.

The state advances nine-tenths of the value of the property and the settler can not obtain loans on more than one piece of property.

The prospective settler must have available capital amounting to at least one-tenth of the value of the holding which he wishes to acquire; he must reside on the land; must cultivate it according to the system ordinarily adopted; and must be supplied with the necessary equipment and livestock.

The dwelling house, livestock, and equipment must be insured against fire in a company recognized by the state.

A part of the loan for the establishment of buildings, up to a maximum of 3,000 crowns, is free of interest. The interest rate is fixed at 4½ per cent. No part of the capital is repaid in the first five years. After five years annual payments are made of 1 per cent of the loans for buildings and 4½ per cent of that part of the building loan on which interest is paid, until the loan has been paid off. Thereafter the annual payment is 5½ per cent of the loan for the acquisition of land until the whole amount is paid off.

The land is acquired by purchase on the favorable terms indicated, subject to the following restrictions until such time as the payment of all that is due the state has been completed:

1. The holding must not be subdivided without the authorization of the ministry of agriculture.

2. The holding can not be transferred to third parties, except to sons or sons-in-law of the holder.

3. On the death of the holder the widow is permitted to continue to occupy the holding subject to the due fulfillment of the conditions laid down.

Since 1899 established holdings amount to 11,451. The total loan and grant of the state amount to about 100,000,000 crowns, of which direct grants amount to about 8,250,000 crowns.

## COLUMBIA BASIN REPORT

(Continued from page 155)

or create real opportunities for settlers. Past experience in this and other irrigated countries is conclusive that solvent reclamation requires a program of settlement and farm development.

We are in accord with the essential features of the settlement and farm development program outlined in this report and believe that its economic features are sound and feasible.

This would involve, however, control of the prices at which privately owned land would be sold either through purchase by the authorities who build the works or through securing control for settlement from private owners. The subdivision of over a million acres of land with about 20,000 farms would have to be thought out and settlers secured who have the equipment and experience needed to cultivate this land, so as to secure satis-

factory returns. The report of the last reviewing board states that financial aid and practical advice to settlers are essential to successful development of this project. The methods of doing these things are still largely untried in this country and the first attempts to utilize them should be on a small scale. Only after enough experience has been had to determine what can be wisely and safely attempted, should they be applied on as gigantic a scale as will be necessary in the development of this project.

It is believed that the Gault report and the reviewing report should be published. The information will be of great value to all directly interested. It will inform the Nation at large of some of the requirements of future reclamation policy. No recommendation looking to further action by Congress is made.

## COST OF MESA GRAPEFRUIT GROVE

**C**ONSIDERATION is being given to the possible formation of another syndicate for the development of grapefruit groves on the Mesa division of the Yuma project, Arizona, similar to the one now in successful operation. All of the lands which it is proposed to bring into the proposed syndicate are lands that are fully paid up and upon which the owners are now paying the minimum water charges of \$15 an acre each year.

In this connection Project Superintendent Preston has prepared the following estimate of what it will cost to develop a 10-acre grove and the probable returns in the first five years. The estimate shows a net cost of developing such a tract, without including the cost of the land and water right, amounting to a little more than \$1,000 an acre. After the fifth year the net returns from a 10-acre grapefruit orchard may be estimated at \$500 to \$1,000 an acre each year, assuming, of course, that proper management and proper care of the trees have been carried on during the developing period.

The whole plan contemplates that the grapefruit trees will be of certified stock, and when they come into bearing will be watched carefully in order to weed out undesirable or unprofitable trees so that every tree is made to produce a profit.

*Estimated cost of bringing into bearing a 10-acre grapefruit grove on the Yuma Mesa under syndicate management*

### FIRST YEAR<sup>1</sup>

Establishing corners and taking topography, at \$2 per acre.....	\$20.00
Average leveling cost, \$60 per acre.....	600.00
Water distribution system, concrete pipes or flumes, \$170 per acre.....	1,700.00
Windbreak on north and west sides of each 10 acres.....	14.20
Trees, average planting 84 trees per acre, at \$1.25.....	1,050.00
Planting, including hauling, staking.....	168.00
Tree protection and installation.....	36.00
Mulching straw, 3 tons per acre, at \$4.....	120.00
Cover crop, seed and inoculation, \$5.50 per acre.....	55.00
Nitrate of soda, 1 pound per tree, ½ ton.....	40.00
Water, first year.....	210.00
Labor and teams, at \$40 per acre.....	400.00
Traveling, miscellaneous items.....	240.00
Incidentals.....	200.00

Supervision and overhead expenses, 15 per cent.....	4,853.20
	727.98
	5,581.18

### SECOND YEAR'S CARE

Traveling, automobile and miscellaneous expense.....	\$240.00
Labor and team hire.....	400.00
Water charges.....	250.00
60 tons manure, at \$3.....	180.00
800 pounds sulphate ammonia, at 5 cents per pound.....	40.00
4,800 pounds complete fertilizer, at 4 cents per pound.....	192.00
	1,302.00
Supervision and overhead expenses, 15 per cent.....	195.30
	1,497.30

### THIRD YEAR'S CARE

Traveling, automobile and miscellaneous expense.....	\$240.00
Labor and team hire.....	400.00
Water charges.....	250.00
80 tons manure, at \$3.....	240.00
1,600 pounds sulphate ammonia, at 5 cents per pound.....	80.00
9,600 pounds complete fertilizer, at 4 cents per pound.....	384.00
	1,594.00
Supervision and overhead expenses.....	239.10
	1,833.10

### FOURTH YEAR'S CARE

Traveling, automobile and miscellaneous expense.....	\$240.00
Labor and team hire.....	400.00
Water charges.....	250.00
100 tons manure, at \$3.....	300.00
1,600 pounds sulphate of ammonia, at 5 cents per pound.....	80.00
16,000 pounds complete fertilizer, at 4 cents per pound.....	640.00
	1,910.00
Supervision and overhead expenses, 15 per cent.....	286.50
	2,196.50
Less credit by crop produced third year, 800 trees, average one-half box per tree; 400 boxes, at 4 cents per pound.....	640.00
Net expenditure.....	1,556.50

### FIFTH YEAR'S CARE

Traveling, automobile and miscellaneous expense.....	\$240.00
Labor and team hire.....	400.00
Water charges.....	250.00
120 tons manure, at \$3.....	360.00
1,600 pounds sulphate of ammonia, at 5 cents per pound.....	80.00
16,000 pounds complete fertilizer, at 4 cents per pound.....	640.00
	1,970.00
Supervision and overhead expenses, 15 per cent.....	295.50
	2,265.50
Less credit by crop produced fourth year, 800 trees, average 2 boxes; 1,600 boxes, at 4 cents per pound.....	2,650.00
Net credit.....	295.50

### SUMMARY

First year.....	\$5,581.18
Second year.....	1,497.30
Third year.....	1,833.10
Fourth year.....	1,556.50
Fifth year.....	295.50
Total cost to end of fifth year <sup>1</sup> .....	10,172.50

<sup>1</sup> First year includes all expenditures up to end of year in which trees were planted ending with March 31 next after time of planting in April or May. Years thereafter are from April 1 to March 31.

<sup>2</sup> Does not include cost of land and water-right purchase.

<sup>3</sup> Credit.

Other things being equal, the farmer who diversifies and can employ his laborers all the year can more easily obtain and hold an efficient class of workers.

## IMPROVEMENT ON LOWER YELLOWSTONE

**R**ECENT reports indicate that the general feeling among the water users on the Lower Yellowstone project is that the water charges should be paid as they become due. The farmers are almost unanimous in agreeing that the only way the project can be a success is to get on a cash basis and then force out the drones.

Collections from January 1, 1925, to the middle of August received by the project office or in the hands of the county treasurer amounted to \$28,523.01. Nearly \$10,000 was collected in the month of July, which is considered very encouraging, since at this season of year no returns are being received by the farmers and they have heavy expense financing their beet labor and other help necessary to produce a crop. They are further handicapped in making payment of Government charges in that the State law does not permit separate payment of irrigation charges. All taxes have to be paid at the same time.

In addition to the money already paid in, letters have been received from many farmers promising to pay one or more years' delinquent charges as soon as their crops are sold this fall.

During the past two years the agriculture of the project has made great strides

forward, owing to the establishment of crops that have a good cash value. Sugar beets, peas, beans, and cucumbers may all be contracted, so that the farmer does not have to depend on the whim of the market when the time comes to sell. The erection of a sugar factory this year will result in a saving to the farmers of \$75,000 to \$100,000 in freight annually, which alone is enough to pay all the money due the Government. Then, too, the production of beets compels better farming methods, which can not fail to be reflected in the returns from other crops.

During the recent visit of the congressional committee to the project Congressman Cramton is reported to have been agreeably surprised to see the development that has taken place there. He is stated to have remarked several times that the possibilities of the project far exceeded his previous conception of it based on the reports he had read.

When the soil is irrigated by flooding from field laterals an uneven surface causes needless waste of water, extra labor in spreading it over the surface, and smaller yields.



## NOTES ON PERSONNEL AND PROJECT VISITORS

**R. F. WALTER**, chief engineer, and **George C. Kreutzer**, director of reclamation economics, spent several days in August on the Okanogan project, Washington, investigating the possibility of an additional water supply for the project from the Methow River.

**Andrew Weiss**, assistant director of reclamation economics, spent the month in Salt Lake City in connection with the work of the Board of Survey and Adjustments for the northern division.

**Miss Emma A. Gibbs**, of the Denver office, secretary of the Board of Survey and Adjustments for the northern division, and **Miss Gladys M. Cummings**, secretary of the board for the southern division, are working in the Washington office coordinating the material for the report.

**George L. Evans**, chief of the mails and files section of the Denver office, was a visitor to the Washington office during the month. Mr. Evans made a brief study of the Washington office filing system and was impressed with its efficiency.

**District Counsel Fullerton** was on the Belle Fourche project August 28 and 29 to confer with irrigation district officials and attend to a number of legal matters.

**A. W. Walker**, of the Denver office, was engaged on land classification and an economic survey of the Tule Lake division of the Klamath project during the first half of the month.

Visitors to the Lower Yellowstone project during August included **H. W. Byerly**, general immigration agent, and **W. P. Stapleton**, agricultural development agent, Northern Pacific Railway; and **A. H. Bowman**, commissioner of agriculture of Montana.

**S. O. Harper**, general superintendent of construction, spent August 3-5 on the Newlands project, inspecting the proposed Spanish Springs dam site.

**Engineer Harvey McPhail**, of the electrical division of the Denver office, spent some time in Reno investigating power matters in connection with the proposed Spanish Springs development.

**District Counsel R. J. Coffey** visited the Orland project during the month in connection with legal matters affecting the project.

**A. S. Dawson**, chief engineer, department of natural resources, Canadian Pacific Railway, was a visitor on the Grand Valley, Uncompahgre, Minidoka, North Platte, and Strawberry Valley projects.

**R. F. Walter**, chief engineer, and **George C. Kreutzer**, director of reclamation economics, arrived at Plymouth, Wash., on August 29. They were met by delegations from Pendleton and Portland interested in the Umatilla Rapida development, and spent the remainder of the day

inspecting lands claimed to be susceptible of irrigation in Washington and Oregon. On the 30th they left for McKay Dam.

Distinguished visitors on the Uncompahgre project during August included **Prof. Duff Abrams**, director of the Lewis Institute of Chicago; **G. W. Anderson**, engineer with the Burlington Railroad; **P. H. Bates**, of the Bureau of Standards; and **W. B. Cheek**, of the Portland Cement Manufacturers Association.

**Robert B. Van Horn**, maintenance engineer on the Tieton division, Yakima project, has resigned to accept a position as instructor in the engineering department of the University of Washington. His place on the project has been filled by the transfer from the storage division of **Tom C. Mead**. **H. Ellis Sealing**, senior draftsman, who has been engaged on the topographic surveys on the Kittitas division, has been transferred to Yakima to fill Mr. Mead's place.

**E. B. Debler**, of the Denver office, spent several days at American Falls Dam. **W. H. Nalder** and **B. W. Steels**, also of the Denver office, visited the work later in the month.

**District Counsel Hamele** was in the Denver office early in the month in connection with his work of revising the manual, returning to his headquarters at El Paso on the 5th.

**Hon. Louis C. Cramton**, chairman of the Subcommittee of the House Committee on Appropriations, in charge of the Interior Department appropriation bill, together with Congressmen **Frank Murphy** and **Scott Leavitt**, and **F. J. Bailey**, of the Bureau of the Budget, visited the Huntley, Shoshone, and King Hill projects, and American Falls Dam during the month. They were accompanied on the Huntley project by **Hon. Charles H. Burke**, Commissioner of Indian Affairs.

**Ellis H. Diehl**, chief clerk on the Minidoka project, has resigned, the resignation taking effect on September 11. Mr. Diehl has accepted employment in a public accounting office in California. He has been employed by the bureau since February 26, 1918.



Land in high cultivation on the Grand Valley project, Colorado



ACCRETIONS TO THE RECLAMATION FUND AND INVESTMENT OF THE UNITED STATES, BY STATES, JUNE 30, 1925

	Revenue collected from sale of public lands, mineral leases, etc., for the reclamation fund	Expended by the United States for reclamation <sup>1</sup>	Authorized under appropriation fiscal year 1926
Alabama.....	\$45,349.50		
Arizona.....	2,181,539.75	\$18,543,088.89	\$832,000.00
California.....	12,251,199.63	4,430,188.60	596,000.00
Colorado.....	9,877,084.50	11,638,733.35	441,000.00
Idaho.....	6,920,637.77	25,549,365.53	1,382,000.00
Kansas.....	1,053,483.94	334,474.96	
Louisiana.....	2,108.76		
Montana.....	15,439,148.01	16,263,280.74	930,000.00
Nebraska.....	2,082,192.33	13,065,310.00	980,000.00
Nevada.....	931,817.68	7,746,140.19	912,000.00
New Mexico.....	5,852,467.51	9,315,648.15	475,000.00
North Dakota.....	12,217,927.22	2,595,262.51	90,000.00
Oklahoma.....	5,921,707.68	84,349.93	
Oregon.....	11,675,476.36	9,247,709.43	2,355,000.00
South Dakota.....	7,765,206.35	4,167,807.86	165,000.00
Texas.....		6,339,628.63	245,000.00
Utah.....	3,765,314.77	3,074,435.40	1,305,000.00
Washington.....	7,299,498.39	16,169,715.77	1,115,000.00
Wyoming.....	26,225,367.79	16,238,327.59	1,534,000.00
Totals.....	131,487,527.94	165,404,437.53	13,357,000.00
Cost of secondary investigations, economic surveys and land settlement not allocated to States.....		615,361.49	159,000.00
Total.....		166,019,799.02	13,516,000.00
Total expenditures to June 30, 1925, for all operations.....		205,000,000.00	

<sup>1</sup> Includes cost of irrigation works and investigations, cost of operation and maintenance prior to public notice (net), deficits and arrearages in operation and maintenance after public notice to be repaid with construction, and unpaid charges for operation and maintenance after public notice.

## COMMISSIONER CALLS SETTLEMENT MEETING

The representatives of the colonization and settlement organizations of western and southeastern railroads, and representatives of the State colleges of agriculture have been invited to attend a conference in Washington on December 14 and 15 to discuss settlement of reclaimed areas of the arid and semiarid regions of the West, and the swamp and cut-over regions of the South. This and related subjects will be combined in a program which it is believed will be of mutual benefit to the Bureau of Reclamation and others interested in rural development.

Although the program has not yet been definitely formulated, it is planned to have a few addresses, illustrated by motion pictures and colored lantern slides, to be followed by informal discussion of the various topics.

Secretary Work will make the opening address at the conference and an invitation has been extended to Secretary Jardine to be present and address the meeting.

That the conference will be a success is indicated by the large number of acceptances already received.

On the capital invested in agriculture the return for the year ended June 30, 1925, was at the rate of 4.6 per cent compared with 3.3 per cent in the year ended June 30, 1924.

## FARMERS USE RADIO FOR NEWS OF MARKETS

More than 550,000 farms in the United States are equipped with radio, as compared with 365,000 in 1924 and 145,000 in 1923.

This rapid increase in the use of radio is attributed to the need of prompt market information in merchandising farm products, to the educational value of radio, and to its entertainment features.

## OWYHEE PROJECT CLAIMS PRESENTED

The following is from a statement read by Mr. E. C. Van Petten on the occasion of the visit of Secretary Work and Commissioner Mead to Ontario, Oreg., in which Mr. Van Petten presented very forcefully the claims of the Owyhee project:

In the Owyhee project you have not only eliminated all the rough land as of old, but have given each 40 acres a careful soil survey by men who could spot a piece of greasewood a half mile away, and they have eliminated every piece of land with greasewood or an alkali spot on it. From this project you have eliminated every acre of all except first and second class lands, although we note most of the other new projects have taken into their acreage third and some fourth class lands. Mr. Strahorn did not leave an acre in the project but will stand a higher water charge than the project figures.

Doctor Mead, in a letter addressed to me June 4, says:

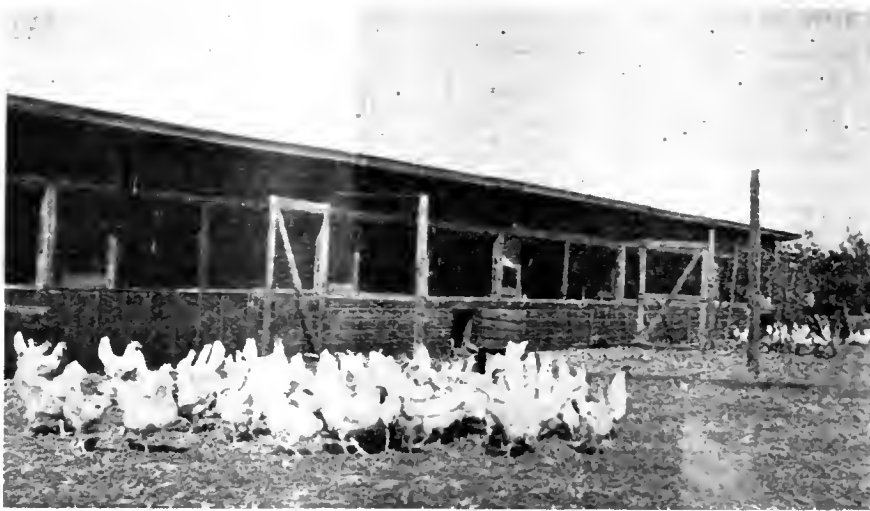
"The feasibility of these two projects (Vale and Owyhee) seems to hang on working out plans of prompt settlement and agricultural development. This is what all of us must be thinking about, and I am writing you to urge your co-operation."

We agree with Doctor Mead in the necessity of foreseeing things that affect the welfare of the project. The old Chinese proverb fits the situation: "He who starts in the wrong direction makes the journey twice."

An average of 2,500 horsepower-hours is utilized on each farm.



A Boise project apple orchard



Part of Mrs. Will Rhodes's flock

### POULTRY RAISING PRODUCES PROFITS

Mrs. Will Rhodes, of Hermiston, Oreg., on the Umatilla irrigation project, has furnished the following statement showing the results obtained from 600 day-old chicks from April 11 to December 31, 1924:

ASSETS	
Receipts:	
Eggs sold.....	\$225.08
Cockerels sold.....	137.25
Pullets.....	153.50
Cockerels on hand.....	30.00
Pullets on hand.....	292.50
Feed on hand.....	40.35
Total.....	\$78.68
LIABILITIES	
Expenditure:	
Cost 600 day-old chicks.....	135.00
Cost of feed.....	259.97
Depreciation on buildings, 9 months.....	22.50
Subtotal.....	417.47
Net earnings for the period.....	461.21
Total.....	\$78.68

### WAGES FOR LABOR MORE THAN DOUBLE

An interesting sidelight on the increasing cost of construction of irrigation projects is given in the accompanying chart, which shows the average rate of wages paid for common labor on 28 reclamation projects, 1904 to 1925, inclusive.

The chart, data for which were compiled by W. I. Swanton, an engineer in the Washington office of the Bureau of Reclamation, shows that, with moderate fluctuations the average rate was practically the same from 1904 to the latter part of 1915, when the influence of the war began to be reflected in the wages demanded, resulting in a comparatively sharp rise to the peak early in 1920. The period of deflation and consequent unemployment is indicated by the equally sharp drop in the average rate from 1920

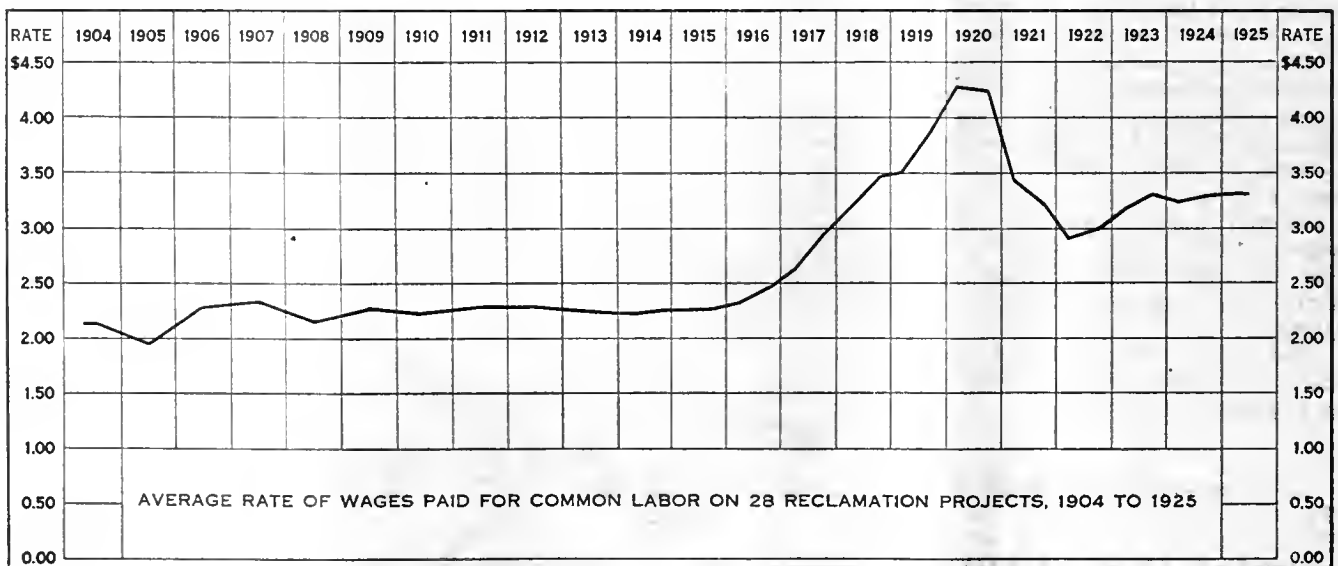
to 1922, when, following more nearly normal conditions, the rate begins to climb again to the present average, approximately 50 per cent higher than that of the pre-war period.

### LIVESTOCK INCREASE YIELD OF ALFALFA

C. L. Smith, agriculturist of the Union Pacific system, states that in one of the fertile irrigated valleys of the West, where alfalfa hay is one of the leading market crops, the average yield per acre has steadily decreased for the past 10 years. This decrease is on farms where no livestock is kept, and as all the hay produced has been sold the yield has dropped from 6 or 7 tons per acre down to 3 or 3½ tons. On adjoining farms where livestock is kept, the hay fed on the farm, and the manure intelligently applied the yield of alfalfa amounts to 7 or 8 tons per acre.

This emphasizes the fact that, to be permanently successful, more attention must be given to the maintenance of soil fertility. Diversity of crops and systematic crop rotation, with livestock in some form, are now and have been for ages the best, most economical, and satisfactory method of maintaining soil fertility. When a man can realize \$13 per ton for his hay, or \$6.50 per ton for corn silage, by feeding it to lambs on his own farm he should consider that he has marketed his labor at a fair price if his only profit is the manure.

Too much bedding in the hog house causes the hogs to sweat badly.



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NEW

# RECLAMATION ERA

VOL. 16

NOVEMBER, 1925

NO. 11



THE IRRIGATION PROJECTS RAISE THOUSANDS OF TURKEYS ANNUALLY FOR THE HOLIDAY TRADE

*SUCCESS in irrigated agriculture and the solvency of reclamation projects depend on selection of settlers, peopling the land with men who have the experience and the skill to grow high priced crops and to cultivate the land in a way to get large returns. Poor farming, growing of crops that require little skill or care in cultivation, and which bring small returns, characterize most of the projects where payments are not being made.*

*One of the first conditions in the beginning of new projects is to work out an agricultural program, to determine what kind of crops ought to be grown, and to endeavor to secure settlers who like that kind of agriculture. The beginning of a new project gives an opportunity that ought to be used to make cooperation the basis of its organization, to try and unite the settlers so that they will grow enough of particular crops or produce to enable them to sell at an advantage, and to use teamwork in doing so. Only in this way can the man on 20 or 40 acres do business on equal terms with the farmer on 1,000 acres.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

NOVEMBER, 1925

No. 11

## HIGH LIGHTS IN A REVIEW OF THE MONTH

**T**HE field man of the sugar company makes the conservative prediction that the beet fields of the Powell Valley, Shoshone project, will produce an average yield of  $12\frac{1}{2}$  tons an acre, an increase of nearly 2 tons over the yield of previous seasons. At the contract price of \$6.50 a ton, without including expected bonuses on the basis of sugar content, beets will bring a cash return to the farmers of \$200,000, or more than \$80 an acre.

**T**HE Churchill County Eagle sums up the cantaloupe situation this year on the Newlands project as follows: Shipments strong; returns satisfactory; yields excellent; and quality very fine. More than 200 cars of melons have been shipped. Jones & Jewell harvested 2,307 standard crates from  $6\frac{1}{2}$  acres, making an average of 355 crates per acre. A. H. Groth shipped 2,750 crates, and Sutton Bros. 4,000 crates.

**R**EPORTS on some 3,000 cars of cantaloupes shipped from the Salt River and Yuma projects indicate that they went to 110 cities and towns in 36 States and Canada. The estimated total movement of Arizona cantaloupes this season is around 3,800 cars, thus breaking all previous records.

**T**HE grain producing territory in the Klamath irrigation project and in Tule Lake will produce an estimated crop of 800,000 bushels, valued at approximately \$850,000. Wheat is estimated at 250,000 bushels, and rye, barley, and oats at 175,000 bushels each.

**S**EVENTY-FIVE carloads of sugar beets will be shipped from Klamath County to the Sacramento Valley Sugar Co. The field representative of the sugar company stated that although late planting precluded any phenomenal crops, the grade of sugar beets raised in Klamath this year is equal to and, in most cases, better than the best beets raised anywhere in the West.

**A** CATTLE buyer from California recently purchased 10 head of registered cattle from the Longcath farm on the Newlands project. He was attracted to this territory because of its freedom from tuberculosis. It is not the policy to encourage the exportation of grade cattle from the project, but an occasional exportation of a few head serves to stimulate interest among local dairymen in their herds and assist in establishing a price locally.

**I**N accordance with an act of Congress, the Secretary of the Interior recently authorized the sale or lease of the Williston project. The property to be disposed of includes an electric power system, irrigation works, city waterworks, the lease of a coal mine, and the purchase of certain miscellaneous equipment. Competitive bids will be received on November 2. The proceeds of the sale will be paid into the reclamation fund.

**T**HE record price of  $61\frac{1}{2}$  cents per pound for butterfat was paid to dairymen on the Newlands project in September. The project farmers think this is a pretty good answer to the question, Does dairying pay?

**T**HE pickle-salting station at Nisland, Belle Fourche project, was closed on September 23, when the Mexicans were ready to start on the beet harvest. About 25,000 bushels of cucumber pickles were grown on the project and the average price was about \$1 a bushel. Some fields gave a return of \$200 to \$450 an acre.

**A**N effort is being made on the River-ton project to induce owners of private lands for which water will be available in the spring of 1926 to sign a three-year contract to take water on a rental basis. Steps are also being taken to open to entry a number of the desirable pieces of public land lying in the same part of the project.

**A** 10-ACRE grapefruit orchard on the Yuma Mesa, set out in the spring of 1923, will yield about 15 fruit per tree, or about 150 boxes for the 10 acres. All of the Mesa orchards are in very good condition.

**T**HE annual fair of Dona Ana County, Rio Grande project, was held from October 7 to 10, a particular feature being the competition between local farm bureaus in the exhibits. A cotton exposition is planned for El Paso from October 26 to November 2.

**H**ARVESTING of an unusually abundant crop has occupied the entire Yakima project, with prospects for excellent prices for all farm products. Shipments from the project were unusually heavy, totalling 9,529 carloads for the season, compared with 4,251 for the same period in 1924, and valued at \$6,000,000 to \$7,000,000. In view of the extremely satisfactory crop returns throughout the valley it is anticipated that payments will be met more promptly than in the past.

**A**BOUT 60 acres of cotton were grown on the Orland project this season, but when this was written it had not yet matured sufficiently for picking, and its success as a project crop is still to be demonstrated.

**S**EVERAL farmers on the Grand Valley project are contracting to feed sheep and cattle during the coming winter. This will not only furnish an outlet for surplus forage, but will increase the fertility of some farms which are particularly in need of this treatment.

**A**GRICULTURAL fairs were held on the Minidoka project at Burley on September 2 to 4 and at Rupert September 18 and 19. At each point splendid exhibits of farm products and livestock were displayed.



## THE PROBLEMS OF FEDERAL RECLAMATION

*Address by Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, delivered on October 26, 1925, at Chicago, Ill., before the Western Society of Civil Engineers*

**O**PPORTUNITIES for home making on the public lands of this country have been the greatest single influence in shaping our national character. Free land was the beacon hope that attracted the hardy and adventurous from the hills of New England and from the farms of Germany, England, and the Scandinavian countries. The voice of opportunity called and found a response in the energetic, self-reliant, and ambitious.

This westward march of settlement continued without interruption until it reached the borders of the land of uncertain and scanty rain. There it halted because it encountered obstacles that individuals working alone could not overcome. Up to that time the creation of homes had been an individual matter. The pioneer believed that every man should hoe his own row and take care of himself. It created a confident and hopeful people but made them migratory and speculative. The pioneer was not a good farmer. He was ready to move on when there was a chance to sell out at a profit, and gave little thought to the needs of the rural civilization he was helping to create.

The development of irrigation requires a different attitude. It imposes laws of its own which must be observed. People who live under irrigation canals must cooperate. They are bound together by their common tie of dependence on the stream. Protected by irrigation from the uncertainties and vicissitudes of rainfall, that insurance has to be paid for. They have to level their fields so water will flow over them evenly. They have to pay large assessments to maintain and operate these works. To meet these charges the irrigator has to be a skilled cultivator; only the good farmer permanently survives. The best cultivated farms on this continent are in irrigation districts. Those around Greeley, Colo., rival those of the Lothians in Scotland.

Whether he likes it or not, the farmer under irrigation has to lose some of his freedom. He must keep step with his neighbors and irrigate when his turn comes. This means that plans must be made in advance and a kind of organization adopted that the farmer who depends on rain can ignore.

The pioneer settlers of the arid region did not at once realize the profound change which irrigation would enforce. They gave little thought to the institutions they must adopt. For a time they

were able to work and think as individuals. By means of a simple plow furrow they turned water from streams over the thirsty soil of the low-lying bottom lands. But opportunities for this kind of development were limited. Soon the bottom lands had been filed on, all the cheap ditches had been built.

Then it began to be realized that if the magic touch of water was to bring into fruition the latent agricultural wealth of this inland empire, a different and much costlier type of irrigation work had to be brought into being. Reservoirs were needed to hold back the floods, costly aqueducts had to be carried through precipitous mountain canyons. Only in this way could orchards and gardens be planted and homes made on the better soils of the higher plains.

These great structures cost more money than single settlers, or even organizations of settlers could provide. The capital required soon went beyond the means of corporations. Finally, about the beginning of this century, it was realized that only the Nation or the States had the credit and the reserve of

### PLANS FOR FUTURE RECLAMATION WORK

Doctor Mead has completed work on his annual report to the Secretary of the Interior for the fiscal year ended June 30, 1925, and this is now in the hands of the printer. He has also submitted his budget for the fiscal year 1927 to the Budget Bureau. With these two important subjects taken care of, the commissioner left for a trip to New York and Boston, where he met with representatives of the press and men connected with the furtherance of agriculture and related subjects in our eastern colleges. He returned in time for the hearings scheduled before the Budget Bureau, on October 18.

On Monday, October 26, Doctor Mead delivered an address before the Western Society of Engineers in Chicago, the text of which is carried in this number of the Era.

From Chicago he proceeded to Birmingham, Ala., where he was invited by Governor Whitfield to participate on October 29, in the program of the conference called for the purpose of discussing reclamation projects and other questions of interest to that section of the country.

resources needed to bring into existence the monumental structures required for the complete conquest of the arid region.

The reclamation act passed by Congress in 1902 was the outcome of this new and broader conception of the future of irrigation. It set aside the proceeds from the sales of public land; later on added to this half of the money coming from mineral leases, to create a fund with which to build irrigation works. This fund was to be augmented further by the money received from water users in payment for irrigation works. These payments were to be made in installments extending over 20 years. No interest is charged on deferred payments. Water users pay the equivalent of 5 per cent interest for 20 years and get the works as a gift. Other governments donate a part of the cost of important works but none build them without charging interest.

The act has been in operation for 23 years. About \$160,000,000 has been spent on construction. The repayments have been disappointing. On only one project has even half of the cost been repaid. On some, settlers have paid nothing on construction and are in debt for much of the cost of operation.

In its agricultural aspects, dotting the unpeopled areas with homes has brought large returns. The crops grown in 1924 on 24 projects were worth \$66,488,560. One hundred and forty-three thousand people live on the irrigated farms and an additional 337,000 in project towns and cities. When all the farms are occupied there will be from 15,000 to 20,000 more. Reclamation has done much to save some arid States from economic collapse. The situation in Nevada would be critical if it were not for the Newlands project. Counting those who live on this project, the State has only 70,000 people. This little handful of citizens supports government, schools, courts, and higher education over an area larger than the State of Illinois. Without the Newlands project farms, with their winter feed for range stock, it is difficult to conceive how this State would carry on with its shrinking resources in mines and forests.

Western irrigation areas are now our main source of long-staple cotton. Millions of dollars which now go to the irrigation farmers of Texas, Arizona, and California would, without Federal reclamation, go abroad to the cotton growers of Egypt. Without the local fodder crops of irrigated farms, the range livestock industry of the arid West would collapse.

These Federal projects have given an economic support to cities that sorely needed it. They have increased the business of transcontinental railroads, furnished markets for the products of factories, and contributed far more to the economic strength of this country than is realized in the humid sections of the country.

But along with these achievements, which have gone far to justify the Government's activity in reclamation, there has gone a tragic waste of money, effort, and opportunity, because the problems of finance, of farming, and the human needs of settlers have never been adequately thought out nor plans made to meet them. Lack of economic and social plans have wrecked some projects and have created the problems that the Interior Department and Congress are now seeking to solve.

#### THE LARGER CONCEPTION OF RECLAMATION

Congress realized at the outset that reclamation requires money and skilled engineers. These were provided. It was not realized that money and expert advice and direction in changing the sagebrush deserts into farms would be needed; these were not provided. It was not realized that to repay these immense costs settlers must be skilled cultivators. Their selection and training were ignored.

If reclamation is to go on we must now provide for meeting these human and economic needs. Only by doing this can the monumental enterprises now being pressed on the Government be made a success.

The irrigation works of the Columbia Basin project in Washington will cost nearly \$200,000,000. The water right for a single acre will cost \$158. To that must be added the cost of changing raw land into farms, which will average \$100 an acre. The Colorado River now irrigates 2,000,000 acres. When all its waters have been conserved and used, it will irrigate 6,000,000 acres. The agricultural development of these two valleys will cost more than a billion dollars. Without skilled farmers working with good tools, owning good stock, and using science and skill in cultivation, the money spent on construction will be thrown away. To make these costly works pay there must go with them an agricultural and rural civilization as far removed from that of the covered wagon as that of Denmark is from that of central Africa.

It is a task worthy of our ablest minds, one of the greatest which ever challenged the ability and patriotism of this Republic. Let us, therefore, undertake to appraise some of its requirements and follow

the evolution of the last quarter of a century, in order that we may understand what has been achieved, what mistakes have been made, and what tasks confront us.

#### WE SHOULD PROFIT FROM PAST EXPERIENCE

To begin with, Federal reclamation can not succeed unless it is divorced from politics. Less attention in the future must be given to local importunities. This means disappointing some States which desire the expenditure of a share of the fund within their borders, regardless of the cost or what the results will be after works are built. From the first, western Congressmen have been subjected to strong local pressure to get works built and afterwards to relieve settlers from their payments. The high construction costs of to-day render it imperative that hereafter reclamation be freed from all danger of political control.

The reclamation policy was founded on the theory that if irrigation works were built, settlers would flock in and in some way dig in and succeed as they had on the prairies of Iowa and Kansas. The difference between the conditions which confronted a homesteader in Iowa, where a paying crop could be grown the first year, and in Arizona, where the land had been baked for centuries, and where after costly preparation a year or two of unprofitable watering and cultivation would be needed before good yields could be obtained, was ignored by these beginners.

The settler in Iowa could begin as a farmer, doing farm work. The settler on a reclamation project has at least a year's work that is not agricultural but engineering. He confronts a tract of unlevelled, unfenced sagebrush. Before he can grow a crop he has to have a shelter for his family and his work team. His land has to be fenced to keep out range cattle and sheep. The inequalities of the surface have to be smoothed off so that water will flow over it evenly. For a beginner, this is hard and discouraging work. It requires tools that the farmer from the East has never before seen. It requires a peculiar knack and skill to do the work properly, and it is often enormously expensive, costing as high as \$75 to \$100 an acre. The settler sees his savings eaten up doing unproductive work, and when his capital is gone, he has to succumb.

A majority of settlers on these projects did not know what crops to grow or when they should be watered. All the conditions were strange and new to them. If these harassed farmers could have been organized so that their efforts could have been combined and they could have touched elbows in preparatory develop-

ment, its influence in keeping up their morale would have been invaluable. Working alone, without practical advice or direction, much that they did was done at a disadvantage.

#### THE PROBLEM OF COLLECTION

Lack of aid in farm development has burdened inexperienced settlers on these projects with heavy private indebtedness and caused thousands of mortgage foreclosures. This has demoralized reclamation finances. The unpaid assessments for construction and operation for the five years from 1920 to 1924 total \$8,500,000. This was increased in 1924 by over \$3,000,000. Some of the projects during that period have paid practically everything they owed. Some had paid practically nothing. In some cases failure is due to unfit lands. No matter how hard the settler works, he can not earn the money to repay project costs. On others, a policy of drift has caused good projects to remain undeveloped, the fertile soil uncultivated.

The Lower Yellowstone project in Montana is an example of the latter type. It needs only good farmers working on small farms to make this as good an irrigation project as those around Salt Lake and Denver. Owing to the fact that a large part of the land is held by speculators who are not farmers, only 14,000 acres out of 58,000 acres in the project were irrigated in 1924, fifteen years after water was first supplied. Some of the unirrigated land is dry farmed, there being rain enough to grow small grain; some is still covered with native grass. If these owners had been real irrigators, desiring to farm, no compulsion to irrigate would have been needed, but under a system which opened the land to settlement to the fit and unfit on equal terms, communities were gathered together, here and elsewhere, many of whose members knew nothing of irrigation farming and never intended to become farmers.

On another project which we are trying to salvage, I recently went over the list of occupations of the early settlers. The first was a deep-sea diver, the next was the wife of an itinerant baseball player, the third had been a missionary in China. A defunct bank owned several farms. A painter, a plumber, a carpenter, all living in distant cities, owned farms, all unoccupied and untilled. A transient trained nurse had invested her savings in one of these speculative temptations. She had neither the money nor inclination to do more. None of these people have paid water charges or delinquent county taxes for three to five years. Creation of a

(Continued on page 164)

## PRODUCTIVE VALUE OF WATER AND COST TO PROVIDE IT

*A fundamental study for all future projects—Elimination of land speculation essential to success—Financial conditions of old projects warrant conservatism in new construction*

(Continued from page 163)

great agricultural community or the solvency of an irrigation project can not be secured with this kind of human material. On projects like this the fundamental problem is to get real farmers to replace these derelicts who have given up hope but linger on, like Micawber, waiting for something to turn up. In one neighborhood there are 70 abandoned farms and a lack of morale everywhere. If an expert practical committee had selected these settlers and they had been advised about their work there would now be no important salvage program or possible loss to either settlers or the Government. The deep-sea diver would have stuck to his element, the bank would not have failed.

### WATER FOR IRRIGATION SHOULD BE WORTH ITS COST

The fundamental question of all future projects ought to be, Will the productive value of the water in irrigation be worth what it costs to provide it? This is far more important than it was 25 years ago because the costs of construction and of farm development are two or three times as great as they were then. When Congress passed the reclamation act, \$25 an acre was regarded as the maximum construction cost which any settler could afford to pay. Even this figure seemed preposterous to the pioneer.

About that time a range cattleman met a settler who had agreed to pay \$10 an acre for a water right in a private ditch. He told the settler he could never do it and he might as well end his misery at once by jumping in the river and drowning himself. The cattleman looked on \$10 an acre for a water right as a prohibitive price. He had built his own ditch with a plow and a scraper. He cut the logs for his cabin out of the near-by forest. His pole fence had cost him nothing in money. Time and labor with him had not counted, hence going in debt \$10 an acre, with payments on interest and principal, was regarded as financial folly, foredoomed to disaster.

When, however, bills for Federal projects were presented to settlers, instead of \$25 an acre, the charges often ranged from \$30 to \$100 an acre. On top of this there was a yearly assessment for operating expenses. Out of this have grown controversies which have embittered the relation of the Government and the water users for 20 years.

No one was to blame. The law was an experiment. Conditions which would confront settlers were not foreseen. The agricultural and economic needs of reclamation were not realized.

### LAND SPECULATION MUST BE ELIMINATED

Another evil of reclamation not entirely foreseen, and against which the original law provided inadequate safeguards, was land speculation. This has been a vampire that has done much to destroy the desirable social and economic purposes of the act. The original idea that Government works would be built to irrigate public land, and that this land would be homesteaded free of cost, developed and cultivated by actual owners, has not been carried out. As it has turned out, the act has been largely used as a life-saver for bankrupt private projects.

The first project begun was in Arizona, where on Salt River the land had been acquired by private owners who had built canals to divert the unregulated flow of the river. They found this would not answer. They had full canals in June and empty ones in August. Agriculture was impossible without a storage reservoir to hold back the floods and deliver water for late irrigation. Financially embarrassed private projects could not build the reservoir. The Government undertook it. Then it was found that the private projects could not raise money to repair and enlarge their canals so they could use the stored water. The Government then acquired the canals. Finally it became a Government scheme, serving land which was in private ownership when the project was authorized. Eastern capitalists held thousands of acres of this land. Speculators also rushed in and bought, at low prices, thousands of other acres.

On all the projects, unwary people attracted by misleading publicity, bought farms from speculative owners at inflated prices. Land sellers told settlers they would have no trouble with water right payments and so induced them to invest their capital in land, and when pressed to pay the Government charges the embarrassed settlers made recurring appeals to Congress for relief.

Between 1921 and 1924 three bills were passed by Congress authorizing or requiring deferment of payments. These

deferments did not aid the struggling settler who had already paid his Government assessments. The relief all went to the nondebt payer. The purpose behind these moratoriums was commendable, but their influence has been demoralizing. They have created a wrong psychology on some projects. They have placed the nondebt payer in the saddle. They have demoralized the bureau's finances and broken down the morale of the local officials, who have been struggling against heavy odds to keep the projects solvent undertakings.

Believing that blanket moratoriums are an economic evil, I notified settlers in spring of 1925 that hereafter relief, when extended, would be to individuals; and to them only after a showing that the delinquency was due to obstacles they were unable to overcome. That notice has caused the bureau to lead a strenuous life. Applications for individual relief came in this year by the thousands. They had to be examined and reported on in the field, and then scrutinized in the Washington office. In all cases the underlying idea was to give them a sympathetic consideration, but to insist on payments where the Government's generosity was being abused. As a result of this action, hundreds of thousands of dollars were collected where blanket deferment would have resulted in nonpayment.

### FINANCIAL CONDITIONS ON OLD PROJECTS REQUIRE CONSERVATIVE ACTION IN STARTING NEW ONES

Financial and agricultural conditions on the older projects require that careful attention be given to all matters which will affect the solvency of new ones. The last Congress made appropriations for six new projects. Their acre-cost is far higher than that of any Government works hitherto built, either in this or any other country. The estimated costs vary from \$125 to \$160 an acre. The land is unimproved. Everything needed to make a farm will have to be placed on it and this will cost on an average about \$100 an acre. The settler will, therefore, face an investment of between \$225 and \$260 an acre when his farm is a going concern, and the question is will these farms be in demand by people able to develop and pay for them? Local people assure us that we need have no fears about settlers or payments. They insist that the farms will be taken and that the charges will be

paid, but their judgment may be biased by their passionate desire for development. When these appropriations were under consideration, I appeared before the Appropriations Committees of both Houses of Congress, and stated my conviction that without adequate aid and direction in settlement and farm development, none of these projects would be a success. I stated that it would require from \$5,000 to \$7,000 to improve and equip an 80-acre farm; that settlers with this much capital would not pioneer, because they could buy improved farms in the East or South.

I believe we must look for settlers who have between \$2,000 and \$3,000, which is enough to underwrite a loan for completing farm development. I believe if we accept them as settlers and permit them to expend all their capital we are bound to provide a source from which the remainder of the capital needed to complete farm development can be secured.

An excellent bill for this purpose was introduced in the House and in the Senate by Congressman Winter and Senator Kendrick, respectively. It provided for advances of money from the reclamation fund. It was my recommendation, however, that if this were done, instead of applying the law to all the projects, it should apply to only two or three where

it would be treated as an educational measure, as an experiment or demonstration, rather than a definite policy.

The outcome of the discussion in Congress was provision in appropriation legislation for four projects that States should furnish aid and direction in settlement and farm development. On these four projects the State is required to supervise settlement of the land and provide credit for developing farms. None of the States are willing to do this. This is the feature of reclamation which we have thus far ignored, but it is not new in other countries. Aid and direction in farm development are fundamentals of reclamation development in India, Italy, Australia, and South Africa. Agricultural development will be advanced by being decentralized by taking it away from the Federal Government. Aid and direction in settlement and farm development is a proper function of the State. Unless it is provided by the State or some other local agency the building of canals should cease. We must not build them for speculative landowners. Helping men own farms has changed Denmark from a land of discouraged impoverished tenants to a teacher of agriculture to the rest of the world. That comes from having 90 per cent of the land cultivated by owners.

An act passed by the last Congress requires that hereafter there shall be a thorough soil survey of the lands of each new project; that the land shall be classified according to earning power and that annual payments for water right shall be in an amount equal to 5 per cent of the average gross crop return. Recent regulations of the Secretary provide that settlers on public land must have a capital of \$2,000 and have had at least two years' experience. This is the first time in the Nation's history that qualifications for settlement have been required. The required qualifications of industry, experience, character, and capital are indispensable to success if we are to build costly works. The inexperienced and those without money would fail, and in the end the loss would fall on the Government.

Fairness to the settler and to the scheme requires that whoever undertakes to subdue the desert and bear the burden of its costs should be fitted for the task. If reclamation is to be the chief instrument in building up rural civilization in the western third of our country, it must provide real opportunities for home makers, give them a lifetime in which to develop and pay for farms, and have efficiency and integrity as the watchword in all relations between the water user and the Government.



CONGRESSIONAL PARTY INSPECTING THE KITTITAS DIVISION OF THE YAKIMA PROJECT, WASHINGTON

Left to right: J. C. Hubbell, Bruce Bonny, Congressman John W. Summers, Oro McDermith, Congressman Louis C. Cramton, J. L. Lytel, project superintendent, Congressman Burton L. French, Congressman Addison T. Smith, F. A. Kern



## THINGS A PROSPECTIVE SETTLER SHOULD KNOW

*The price of improved and unimproved land on the projects, the cost of equipment and improvements, the settler's capital, how he can augment it by loans, and the interest he will have to pay*

THE Reclamation Bureau recently called for information concerning the price of improved and unimproved land on the projects, the best size of farms, the cost to improve and equip the farm, and the amount of capital needed by an experienced settler, exclusive of the purchase price of the farm, in order to succeed on an undeveloped farm. The replies, as far as received, are summarized in the accompanying table.

An additional question covered the sources from which settlers can borrow money to supplement their capital to develop farms, the length of payment period, and interest rates. Information on this important point was furnished by the projects as follows:

**Yuma project, Arizona-California.**—Local banks loan money on crop mortgages or under certain conditions as second mortgages upon the farm at rates of interest running from 8 to 10 per cent. Generally these loans are short time loans upon crop mortgages. The loan is made in the spring or summer and is paid out of the first returns of the crop.

**Orland project, California.**—Settlers can borrow money from the Federal Land Bank of Berkeley, Calif., the Pacific Coast Joint Stock Land Bank of San Francisco, and private banks, all of which make loans on practically the same terms offered by the Federal land bank,

whose terms are 5½ per cent on a loan extending over 31 years.

**Grand Valley project, Colorado.**—Very few agencies are furnishing money on farms for farm equipment. Most of the land sold for the last few years has been with a small down payment and three or five years for the balance. The deferred payments usually bear interest at 8 per cent, with an occasional loan at 7 per cent. Money is available for short chattel loans from local banks, with a usual period of six months and at the rate of 9 or 10 per cent. The best merchant paper well secured carries an 8 per cent rate.

**Uncompahgre project, Colorado.**—Available sources of loans are banks, loan companies, and individuals. The farm-loan bank is not at present operating in the valley under the project. Loans are usually made for a period of three years, occasionally for five years, the rates averaging 8 per cent for real-estate mortgages and 10 per cent for chattel mortgages.

**King Hill project, Idaho.**—At the present time money can not be obtained on the project farms; and farms in the making stand less chance of obtaining credit. Short-time money is loaned to some extent on crops and chattels, and the usual rate is 10 per cent, although lower in some instances.

**Minidoka project, Idaho.**—Long-term loans can usually be obtained from mort-

gage companies and sometimes from the land banks. Short-term loans on crop mortgages can be obtained from local banks. The prevailing terms and rates for real-estate loans are five years' time and 8 per cent interest. Local banks charge 10 per cent interest on chattel and crop loans, the usual term being three to six months. Renewals can usually be obtained where security is good.

**Huntley project, Montana.**—It is very difficult to borrow money at this time. About the only available source is the Federal land bank. The repayment period covers 33 or 34 years, with interest at about 5½ per cent.

**Milk River project, Montana.**—The right sort can borrow locally, but must show that they are workers and know how to farm under irrigation. Length of payment period, 10 years; interest 6 per cent.

**Lower Yellowstone project, Montana-North Dakota.**—The Federal land bank does not favor loans on this Government project and the local banks can handle only small amounts of short-time paper. The interest rate is 10 per cent on this class of loans.

**North Platte project, Nebraska-Wyoming.**—Money to supplement capital can be borrowed at local banks and from loan companies. Such loans usually run from one to three years and bear interest at 8 to 10 per cent.

**Newlands project, Nevada.**—"It is impossible for a settler to borrow money on his homestead until he has secured a patent from the Government."

**Carlsbad project, New Mexico.**—The best source is the Federal land bank, which loans up to 50 per cent of the estimated value of the farm. The length of payment period is 34 years, and the interest per annum, including payment on principal each year, amounts to 6 per cent.

**Rio Grande project, New Mexico-Texas.**—Federal farm loan banks operate in both districts of the project, and loans are made from such source in reasonable amounts.

**Umatilla project, Oregon.**—There is no available source at present where money can be borrowed to develop a farm. Money is available only for improved places. For example, if a settler were to level 40 acres of land and build his flumes or ditches, he could not borrow money on his farm. If, however, he had enough

Settlement and financial data

Project	Price of private land per acre		Best size of farm	Cost to improve and equip farm	Amount of capital needed by experienced settlers, not including purchase price of farm
	Improved	Unimproved			
Yuma.....	\$150-250	\$50-150	40	\$3,000-\$5,000	-----
Orland.....	250-750	125-150	20	5,000-10,000	\$5,000
Grand Valley.....	90-150	20-50	40-60	2,000	3,500
Uncompahgre.....	50-250	20-100	40-60	2,100-4,600	2,000-5,000
King Hill.....	35-150	1-15	40	5,000	-----
Minidoka.....	75-150	50-75	40	4,000-5,000	3,000
Huntley.....	75-150	10-50	60-80	6,000-10,000	3,000-5,000
Milk River.....	30-75	15-40	80	3,000-4,000	3,000-5,000
Lower Yellowstone.....	40-125	20-50	80	3,000	2,500
North Platte.....	70-200	40-100	80	6,500	5,000
Newlands.....	150	20	40	4,000	4,000
Carlsbad.....	75-250	-----	60-80	3,500-5,200	4,000
Rio Grande.....	150-250	75-150	20-60	2,000-5,000	2,000-5,000
Umatilla.....	150-200	30-50	40	8,000	5,000
Klamath.....	-----	125-20	40-100	4,000-7,000	1,500
Belle Fourche.....	40-125	20-50	80	4,000-6,000	2,500
Strawberry Valley.....	100-200	75-100	40	2,000-3,000	2,000-3,000
Okanogan.....	500-1,000	100-150	5-10	3,500-7,000	2,500-5,000
Yakima.....	800-2,000	40-75	20-80	-----	5,000-7,000
Riverton.....	-----	15-25	80	-----	2,000-5,000
Shoshone.....	-----	-----	60-80	4,000	2,000-4,000

<sup>1</sup> And up.



capital to get a good stand of alfalfa on 20 acres, he might get a \$1,200 loan on a first mortgage. Private capital is out of the market for loans on irrigated lands.

*Klamath project, Oregon-California.*—Local banks help finance those able to show material and moral assets. Ordinarily notes run 90 days to 6 months, sometimes 9 months. The interest rate is 8 per cent.

*Belle Fourche project, South Dakota.*—Local banks have restricted loans to such an extent that only the best farmers with Class A security can obtain short-time loans. The Federal land bank and larger loan companies are not operating on the project, and the State rural credit has suspended activities.

*Strawberry Valley project, Utah.*—Farmers are usually financed through local banks. Seasonal loans for six months are obtained at 8 per cent interest; mortgage loans for 5 to 10 years bear 7 per cent; and the Federal Land Bank of Berkeley, Calif., makes long-time loans over a period of 34 years on the amortization plan at about 5½ per cent.

*Okanogan project, Washington.*—Local banks and mortgage companies are the sources for loans to supplement settlers' capital. At present real estate loans are difficult to secure. Mortgages run from 3 to 10 years, with the average interest rate about 8 per cent. Short-time loans are made at 9 and 10 per cent.

*Yakima project, Washington.*—Money may be borrowed from private loan companies on unimproved land of good quality; and the Federal land bank and mortgage loan companies loan reasonable amounts on improved land at varying rates from 5 to 8 per cent.

*Riverton project, Wyoming.*—Settlers of good character on unimproved land whose farm equipment is unencumbered can get money for seed and similar purposes from local banks on chattel mortgages for a term of six to nine months at 8 to 10 per cent interest.

*Shoshone project, Wyoming.*—At the present time it is doubtful if a new settler could borrow money to supplement his capital. The local banks have loaned to the limit. The State of Wyoming has appropriated \$2,000,000 to be loaned to farmers of the State under a 30-year 5 per cent amortization plan of payment, but as yet none of this money has been placed on the project.

Feeders who can not understand the poor condition of their animals when given good feeds, should examine them carefully for ailments and remove the cause.

## SOUND ECONOMIC BASIS NECESSARY

By Commissioner Mead

AN erroneous impression seems to prevail that there has been needless delay or opposition to carrying out reclamation projects for which appropriations have been made by the last Congress.

The bureau desires to carry out the purposes of the reclamation act of December, 1924, and to build projects wherever a sound economic development is assured. It is unwilling, however, to begin construction of any project until arrangements have been made which will comply with the law and insure contented and prosperous homes when those projects have been built.

The situation on old projects, the investigations of the fact finders' committee, and the hearings of the last Congress make it evident that there had been too great haste in the past in beginning construction. Failure to settle in advance all the questions which a project presents has resulted in controversies with irrigators which embitter the relation of the Government and water users after a lapse of 20 years. Another reason for care is the fact that construction costs of new projects are from two to three times what they were 15 years ago and when all the older projects were built. It becomes a serious question, therefore, whether the value of water in production will equal its cost, and this needs to be carefully studied. The Great War has doubled the cost of improving and equipping farms and it is necessary that settlers be informed of the capital they will require and that conditions necessary to enable them to make a comfortable living and repay the money invested by the Government be provided.

### LEGAL WORK OF THE RECLAMATION BUREAU

In the construction, operation and maintenance, and administration of Federal irrigation projects the Bureau of Reclamation is confronted with an array of legal problems. Settlement of water rights, preparing contracts for the building of irrigation works, purchase of machinery, equipment, and other materials, acquisition of rights of way and easements over lands needed for project development are matters requiring the services of members of the legal profession. There are 14 attorneys in the bureau, 4 at the Washington headquarters, and 10 in the field.

The greater part of the land on new projects is privately owned. Some owners hold large tracts. The law requires that these owners shall organize irrigation districts and shall contract to repay the Government all the money spent and that the land they hold in excess of a homestead shall be appraised and the price at which it shall be sold to settlers shall be fixed. Negotiations to perfect these arrangements take time.

In some cases, delays are due to the people most concerned. The Salt Lake Basin project in Utah is an illustration of this. The Government has had its plans and estimates for this work ready for months. The land that is to be irrigated is all settled and the farms on which it is to be used are highly improved, but they have an inadequate water supply from private ditches. The price to be paid for water is satisfactory, but the local organization, which includes some of the ablest business men in the State, has not been able to organize the water users and make the necessary financial arrangements to insure the repayment of \$3,000,000 that the works will cost. Like prudent men, they are taking time to determine what they ought to do. The bureau is willing for them to take this time, but desires the public to understand the causes of the delay.

On the Vale, Oreg., project the contract for the purchase of water may have to be confirmed by the courts before the money is paid and construction begins.

Because of the high construction costs of these new projects which are the highest of any Government irrigation works in any country, Congress required in the appropriations for four projects that the State should undertake the settlement of the land and help finance the development of farms. None of the States in which these projects are located has as yet seen its way clear to assume this financial responsibility.

It is believed that an understanding of conditions on old projects and the problems which confront new ones will justify the actions of the bureau in its efforts to place the operation of old works and the development of new ones on a sound economic basis. With such understanding and the cooperation of Congress and local interests, plans now so well under way will insure without interruption the irrigation development of the West.

## REDUCING THE GAMBLE IN RECLAMATION

*There is demonstrated need for the selection of settlers on the basis of industry, experience, character, and capital, if the Government's investment in reclamation is to be properly safeguarded*

*Editorial from the Engineering News-Record*

FOR the first time in the country's history, the right to settle on public lands is limited by a qualification requirement beyond merely citizenship. The Reclamation Bureau has just put in force on existing projects the settler-selection plan established by the new reclamation laws passed at the last session of Congress. According to the regulations established the settler must have \$2,000 and two years of farm experience to be admissible.

Back of the new system is the hard fact that 15 or 20 years of reclamation experience have shown that farming a piece of desert land under an irrigation ditch requires experience, capital, determination, and hard work. Settlers who lacked experience and capital usually failed, and sooner or later had to go back, bankrupt, to their former occupations. They had, of course, taken this risk when they first decided to try reclamation farming, and their right to gamble against fate in this way is perhaps no one else's business. But their failure proved a serious injury to the progress of the reclamation projects, which makes the matter of much wider concern.

It is strongly asserted by many men of sincere convictions that the adventurous spirit which urges its possessor to stake his future on the long chance of success in making a productive farm home on the irrigated desert is of such remarkable value that nothing should be done to interfere with it. The system now established does interfere with it. It is on this point that sharp differences of view exist.

The advocates of unrestricted settlement assert that a man's freedom to shape his career, take a large risk in doing so, and if necessary to make a failure, is a human right and should not be circumscribed; that the exercise of this right operates to single out the strong and bold and capable and makes them the pioneers and leaders of a new country. They say that any system of exclusion or selection is ruinous paternalism, a substitution of false and unnatural principle for the unerring natural selection upon which we must depend. Those who hold the opposite opinion point to the staggering list of failures in irrigation settlement, and insist that it is folly to lure doctors, grocery

clerks, and school-teachers out into the sagebrush, equipped [with ignorance] of farming and wistful hope, to make inevitable failures. They cite as proof of this folly the huge losses that have resulted from the construction and operation of costly irrigation works supplying water to the farms on which these misfits and incompetents settled, never to contribute a single dollar to operating costs or repayment of the debt resting on the property.

But the views of the two opposing sides are not incompatible. One may concede the excellence of the pioneer spirit—the spirit of adventure, of willingness to bear hardship for a gambling chance of success—and yet recognize that practical considerations and financial prudence must also be kept in mind. The plain fact is that the delicate question in reclamation policy is not whether a man should gamble with his own money, but whether he shall be permitted to gamble with other people's money. Great sums of public money are at stake, and, what is perhaps more important, the welfare of his more capable neighbor settlers, whose prosperity in part depends on his. The selection



Harvesting wheat on an irrigation project

law passed by Congress and the new regulations of the Reclamation Bureau are intended as a partial protection against these evil results, not as a check to pioneering.

The settler prepared to buy a substantial equity in a farm is still completely free to take a flier in reclamation farming, though he may lack experience and be unfit. He is gambling with his own money. But the reclamation homesteader who takes up an irrigated farm unit on little more than an application-fee payment is in a very different position; the Government is his partner. It has furnished him a piece of plant which cost \$5,000 or \$10,000 to build, and depends for repayment of this investment on the settler's chance of success in his farming. If the Government seeks to protect its gamble investment by making sure that the settler is one who has reasonable chances of succeeding, it is exercising only ordinary prudence.

The case at present rests on the demonstrated need for this prudence in reclamation development. Under the original reclamation law the free-for-all principle was assumed to control. The results have been disappointing financially—almost disastrous. The hope back of the present change of system is to take out of reclamation development some of the gamble responsible for these results.

## WANTED: SELECTED FARMERS

*From the Boise Statesman*

**T**HE Reclamation Bureau from now on will restrict settlement on public lands to men with knowledge of farming and enough money to finance their undertaking.

When the western country was reclaimed and settled there were comparatively few failures. The idea grew that anybody could make a living on the reclaimed land of the West. As a matter of fact, however, about 95 per cent of the settlers were farm men, farm raised. They knew the conditions of farming and were willing to meet them and dig a living out of the soil.

When stories of the prosperity of these farmers went over the Nation men flocked to the projects from the cities, bringing with them gas ranges, electric sewing machines, and electric irons. The women had never seen a chicken with its feathers and the men could not harness a horse or milk a cow. They brought failure and misery to the projects of the West. They left hopeless and bitter.

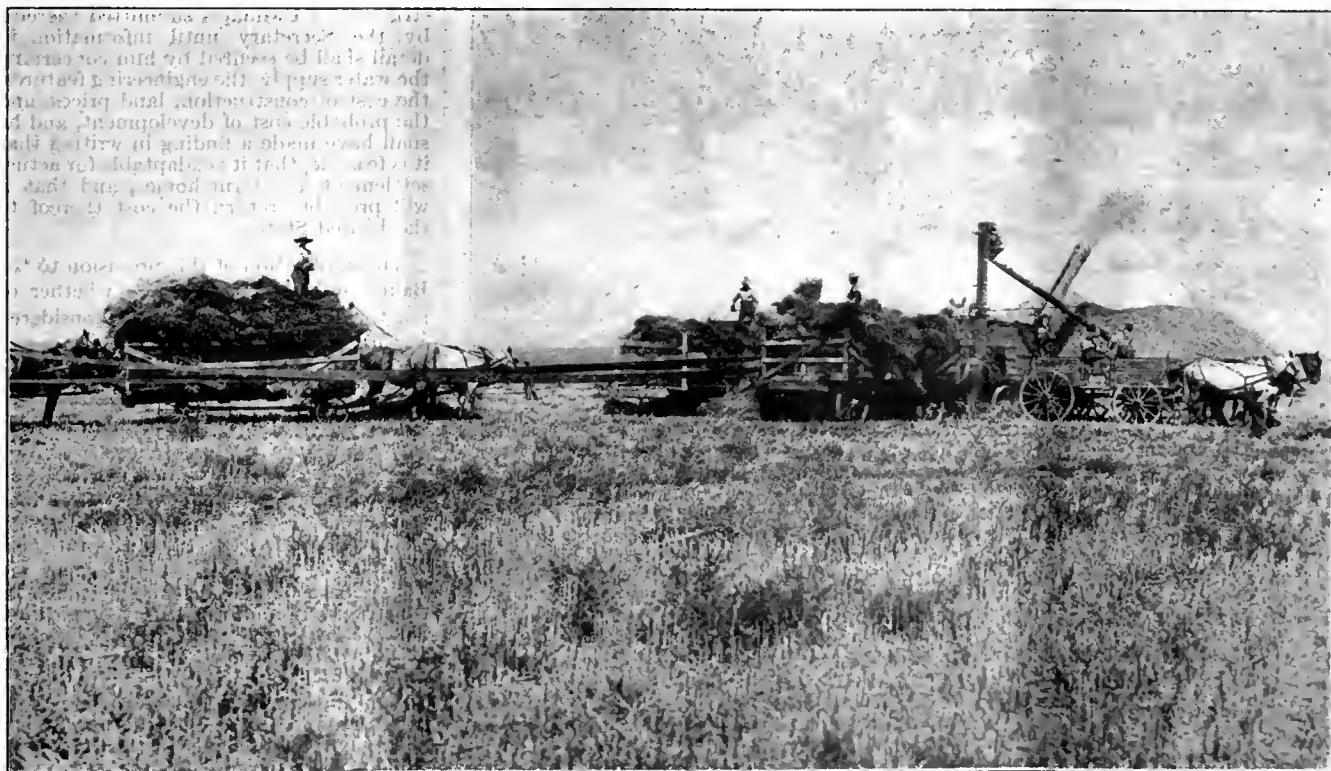
The Dominion of Canada is solving its problem of city-bred farmers by providing schools in which the settlers may learn at least the first principles of agriculture.

Inexperienced men of this country who think they would like to ranch on irrigation projects would profit by going through a two-year apprenticeship with some successful farmer before they attempted the management of a farm of their own. Then they would know how to go about the business and would know whether they had a liking for it.

Farming is becoming more and more a technical profession. A farmer to-day must be business man and mechanic, stock grower and horticulturist. He must work, and think while he is working. The price of stupidity or indolence is failure.

Western projects have had enough of city-bred farmers with only a desire. They are too liable to failure and failures are a liability. If, by reasonable limitations, the bureau can reduce the number of failures it will receive the cooperation of the West.

Animals even of the finest breeding, although given the best feeds in correct proportions, will not make a profit for the feeder if they are not properly cared for and kept in good health.



Threshing on the Lower Yellowstone project, Montana-North Dakota

## BAKER PROJECT NEEDS FURTHER CONGRESSIONAL ACTION

*Attorney General Sargent advises Secretary of the Interior that it is his duty to withhold the beginning of construction until Congress has opportunity to give further consideration to project's feasibility*

IN reply to a letter from the Secretary of the Interior requesting an opinion concerning certain questions in connection with the appropriations for the Baker project, Oregon, the Attorney General, under date of September 17, 1925, wrote as follows:

I have the honor to reply to your letter of July 22, 1925, relating to the Baker reclamation project in Oregon, wherein you state that by the act of March 3, 1925 (43 Stat. 1141, 1168), Congress provided "For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1925 is reappropriated and made available for the fiscal year 1926," and request an opinion upon the following question:

is provided, and in section 2 the Secretary of the Interior is authorized and directed to make examinations and surveys for, and to locate and construct, irrigation works, and to report at each session of Congress "all facts relative to the practicability of each irrigation project." In section 4 it is provided "That upon the determination by the Secretary of the Interior that any irrigation project is practicable, he may cause to be let contracts for the construction of the same \* \* \*." By section 10 the Secretary of the Interior is "authorized to perform any and all acts and to make such rules and regulations as may be necessary to prepare for the purpose of carrying the provisions of this act into full force and effect."

By section 16 of the act of August 13, 1914 (38 Stat. 686-690), it was provided:

such purposes shall be paid out of the reclamation fund provided for by the reclamation law.

It will be noted that whereas under section 2 of the act of June 17, 1902, supra, the Secretary of the Interior was authorized both to select and to construct new projects without additional legislation by Congress, section 16 of the act of August 13, 1914, requires that such expenditures must first be authorized by an appropriation by Congress. Section 16 did not, however, relieve the Secretary of the duty imposed by section 2 of the act of June 17, 1902, to report at each session of Congress "all facts relative to the practicability of each irrigation project," nor did it relieve him of the duty imposed by section 4 of the act of June 17, 1902, to determine the practicability of irrigation projects before the letting of contracts.

The duties of the Secretary as to new projects in this respect are again specified in an amendment to the reclamation law by subsection B of section 4 of the second deficiency act, fiscal year 1924 (43 Stat. 701), passed on December 5, 1924, which provided:

That no new project or new division of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

The application of this provision to the Baker project depends upon whether or not the Baker project may be considered a "new project" within the meaning of the section. In one sense the Baker project is not a new one, inasmuch as appropriations have been made for it each year since 1922, as follows:

For investigation, commencement of construction, and incidental operations, \$400,000. (Fiscal year ending June 30, 1923, act of May 24, 1922, 42 Stat. 552, 585.)

For investigation, commencement of construction, and incidental operations, \$500,000. (Fiscal year ending June 30, 1924, act of January 24, 1923, 42 Stat. 1174, 1207.)

For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1924 is made available for the fiscal year



The first crop

If after investigation I come to the conclusion that the Baker project is not a feasible project, does existing law make it my mandatory duty to begin the construction of the project notwithstanding the conclusion on my part that it is not feasible.

In other words, under existing law, am I compelled to construct the Baker project regardless of its feasibility?

A consideration of the statutes prescribing the duties of the Secretary of the Interior discloses that by the act of June 17, 1902 (32 Stat. 388, et seq.)—constituting the organic act for reclamation projects—a continuing reclamation fund

That from and after July first, nineteen hundred and fifteen, expenditures shall not be made for carrying out the purposes of the reclamation law except out of appropriations made annually by Congress therefor, and the Secretary of the Interior shall, for the fiscal year nineteen hundred and sixteen, and annually thereafter, in the regular Book of Estimates, submit to Congress estimates of the amount of money necessary to be expended for carrying out any or all of the purposes authorized by the reclamation law, including the extension and completion of existing projects and units thereof and the construction of new projects. The annual appropriations made hereunder by Congress for



1925. (Fiscal year ending June 30, 1925, act of June 5, 1924, 43 Stat. 390, 418.)

For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1925 is reappropriated and made available for the fiscal year 1926. (Fiscal year ending June 30, 1926, act of March 3, 1925, 43 Stat. 1141, 1168.)

As indicated by the language of each of the foregoing appropriation acts, and as more fully shown by the hearings before the subcommittees of the House Committees on Appropriations for the Interior Department (see Hearings, fiscal year 1924, pp. 645, 646; fiscal year 1925, pp. 949-996; fiscal year 1926, pp. 483-487), the project was under investigation during that period, and upon the expiration of each fiscal year without construction having started, each appropriation substantially lapsed and the project came to an end. Consequently, each subsequent appropriation constituted a new designation by Congress of the project, and as the second deficiency act was passed December 5, 1924, and the appropriation for the Baker project for the fiscal year 1926 was passed March 3, 1925, it would seem clear that in point of time the Baker project is a "new project" within the meaning of and is controlled by said subsection B. Furthermore, irrespective of the date of original designation, the Baker project is a new project within the purpose of said subsection B in that construction is not yet started, and it was the intention of Congress in subsection B to require all projects thereafter approved by the Secretary of the Interior for the beginning of construction to be based upon findings in writing by the Secretary that they are feasible.

The conclusion that construction should not begin if the project is not feasible is, so far as the Baker project is concerned, in harmony with the attitude of the subcommittee of the House committee during the hearings upon the Interior Department appropriation bill for the fiscal year 1925, when the chairman, in discussing the Baker project, said:

As I have suggested this morning, Commissioner Davis, if, following the designation of a project by Congress, the Reclamation Service should secure new information which gives it reason to relieve that the project is not feasible, I think the service would do the right thing to defer action until Congress can be made acquainted with the facts, and then Congress may make the decision. (Hearings, p. 949.)

This department has had occasion, from time to time, to pass upon situations analogous to the instant one. By the act of March 3, 1893 (27 Stat. 646, 661), Congress provided:

For the purchase of grounds and the erection thereon of a penitentiary, in the State of Washington, under the direction and supervision of the Secretary of the Interior, and upon such tract or parcel of land in said State as shall be designated by said Secretary, thirty thousand dollars.

The appropriation was in fulfillment of a promise made in behalf of the State of Washington in the enabling act of February 22, 1889 (25 Stat. 676, 680), under which the State had been admitted to the Union. It developed that in the interim between 1889 and 1893 the State had built its own penitentiary, and in view of this

### SETTLEMENT MEETING AN ASSURED SUCCESS

*Every indication points to the fact that the meeting called by Commissioner Mead for December 14 and 15 to discuss settlement and development problems of the Bureau of Reclamation will prove of even greater interest and be more conducive of beneficial results than was at first anticipated.*

*Acceptances continue to pour in from representatives of the railroads, of the agricultural colleges, and of other organizations interested in this phase of rural development.*

*Steps are being taken to make the program a notable one. Secretary Work and Secretary Jardine will address the conference. An illustrated talk will be given by Commissioner Mead. Numerous other features are contemplated.*

*A full description of the conference will appear later in the NEW RECLAMATION ERA.*

situation, upon request of the Secretary of the Interior for an opinion, this department advised as follows:

But as I am advised that Washington already has a penitentiary it seems to me the attention of Congress should be called to the matter before any further expenditure of money is made. (21 Op. Atty. Gen. 352, 353.)

In the matter of the construction of battleship No. 34 at the Government navy yard at New York, the Appropriation therefor was restricted to \$6,000,000. The Secretary of the Navy found that the appropriation would not be sufficient, and in response to his request for an opinion as to the course to be followed, this department said:

It follows, therefore, that if you are of the opinion that a battleship of the character contemplated by Congress can not be built at a Government navy yard within the limitation as to cost fixed by the act, it would be improper to proceed further in the matter without additional legislation by Congress. (28 Op. Atty. Gen. 477, 483.)

I have the honor to advise you, therefore, that I am of opinion that if you "come to the conclusion that the Baker project is not a feasible project," existing law does not "make it (your) mandatory duty to begin the construction of the project, notwithstanding the conclusion on (your) part that it is not feasible." On the contrary, I believe it is your duty to withhold the beginning of construction, and to lay the matter before Congress for such action as it may deem proper.

Great quantities of inferior hay, grain, and roughage for which there is no ready market may be fed, with advantage, to livestock.



The site of Guernsey Dam, under construction on the North Platte project, Nebraska-Wyoming



## LOWER KLAMATH LAKE, KLAMATH PROJECT, OREGON

*Investigation of economic conditions by committee of experts finds that lands of lake bed are of little agricultural value, and that it might more properly and beneficially be used as a drainage sump*

**D**URING the latter part of the summer an investigation of the soils and conditions of the lower Klamath Lake region, Klamath project, Oregon, supplemented by extended studies of reports of previous investigations, was made by a committee comprising Charles F. Shaw, professor of soil technology of the University of California; Macy H. Lapham, associate soil technologist of the Department of Agriculture; and W. L. Powers, soil specialist of the Oregon Experiment Station. The conclusions and recommendations in their report are as follows:

### CONCLUSIONS

The lands of the lake bed are of little agricultural value, and it is our unanimous opinion that the lake bed proper is unsuited to permanent agricultural use.

The tule lands on the north and west sides of the lake bed are of fair agricultural value and will probably warrant the cost of reclamation. The tule lands of the east side appear to have a higher content of alkali and to be of less productive value. They probably can not now carry the cost of reclamation and development.

The lands of the Oregon drainage district are being developed with reasonable assurance of success on the peat soil and a probability of failure on the smaller area of lake bed. The lands of the Sheepy Lake and Oklahoma regions are being developed, and the lands irrigated by Willow, Cottonwood, and Sheepy Creeks are producing forage crops and some grain.

Alkali is present throughout the entire area, and injurious concentrations occur in the vicinity of Miller and White Lakes and in other localities. Black alkali may develop unless the soils are well drained and leached.

Drainage is inadequate. Deep drains, necessitating pumping over the straits or into a diked sump, are essential for permanent reclamation.

Surface irrigation is considered an essential for permanent agriculture, with a net duty of 12 to 18 inches depth of water.

The tule or peat lands are combustible and when dry are in danger of destruction by fire. Practically all the peat lands in California are dried and in serious danger of destruction, with large areas already burned off to depths of 2 to 5 feet, often to the clay subsoil. Controlling or extinguishing a fire is never simple and is

especially difficult when the land is in diverse holdings. Irrigation and drainage systems should be planned with the fire hazard in mind and with provision for preventing the spread of fires.

Crops suitable to the soils at this elevation and under the existing climate are grasses and clovers, with some hardy vegetables. Forage crops can be grown, necessitating a stock or possibly a dairy industry to provide a market.

Agricultural, economic, and social conditions preclude close settlement on the peat and call for development of these lands in farm units of considerable size, with buildings limited to those necessary for "camps," or located on the adjacent high lands.

### RECOMMENDATIONS

It is recommended that a drainage sump be established by constructing a levee from a point on the foothill in the vicinity of Brownell northerly to the State line or beyond, thence easterly to the uplands, a probable total distance of about 10 miles. The levee should be of sufficient height to impound water up to the 4,080-foot level. This would provide a sump sufficient to impound all the drainage from the peat lands (keeping the water level in the ditches at 6 feet below the surface) and also care for the flood water from the hill lands.

The water in this sump, seeping into the peat lands on the east side, would in a degree protect them from fire and would moisten them sufficiently to produce a growth of plants that might afford considerable pasturage. If the drainage and flood waters do not maintain sufficient water in the lake to afford reasonable protection to these peat lands from fire, water sufficient for this purpose should be admitted through the straits. The entire lake bed should be covered by water each spring to a level between 4,078 and 4,079 foot elevation.

The establishment of this sump, comprising nearly all of the bed of lower Klamath Lake in California, would not only provide a means of disposing of drainage waters from the reclaimed peat lands, and to a degree protect the peat lands from fire, but it would also reestablish a considerable body of water for bird life. The pasturage of the weed growth on the lake bottom that was available in 1924 and 1925, would be reduced, but the production of grasses and weeds on the unreclaimed peat lands should supply much more pasturage of a better quality.

We consider the lake bed to be unsuitable for agricultural use and that it may be more properly and beneficially used for other purposes. We therefore recommend that it be used as a drainage sump and again covered with water.

## SOIL TREATMENT PROVES EFFECTIVE

**T**HE Grandview Herald, Yakima project, Washington, tells in a recent issue how William Macfadden, who has an apple and Winter Nellis pear orchard 2 miles from Grandview, has demonstrated that great improvement in the productive quality and physical condition of the predominating volcanic ash soil of the district may be brought about by proper treatment.

Mr. Macfadden came to Grandview in 1913 without previous experience in orcharding. He observed the tendency of the soil to pack and bake under irrigation, and started at once to build up the soil by liberal applications of manure and by working in green cover crops. For this purpose he finds giant crimson clover the most effective.

In a short time the soil, which in its raw state refused to hold moisture for any

length of time, became loose and friable. In handling the cover crop, Mr. Macfadden mowed the crop once a year and piled the green fodder in the tree rows. Here it was allowed to decay, while the remainder of the crop was disked in where it grew.

The shallow soil in Mr. Macfadden's vicinity has a tendency to produce undersized fruit, but his efforts have been rewarded to such an extent that his apples and pears consistently run to exceptionally large sizes. In 1923 his Winter Nellis pears averaged larger than ordinary Bartletts, several hundred boxes being more than 10 inches in circumference, with one pear attaining 13½ inches in circumference by actual measurement.

On several occasions his apple trees have supplied a considerable portion of the Grandview exhibit at the Yakima fair.

## THE RIO GRANDE FLOODS OF 1925



Rio Grande just above El Paso, Tex., during the recent floods

**T**HE Elephant Butte storage dam of the Rio Grande Federal irrigation project is located on the Rio Grande 120 miles above El Paso, in the State of New Mexico. The drainage area above Elephant Butte Dam is 30,000 square miles. Below Elephant Butte Dam there is a drainage area of 8,000 square miles in New Mexico subject to summer rainfall on surrounding mesas, the discharge from which reaches the Rio Grande below the dam through a large number of arroyos.

The largest measured discharge of the Rio Grande from upper river sources above the present site of the dam was 33,000 second-feet, which occurred in October, 1904. Previous to the floods of the present year the largest recorded discharge below Elephant Butte was approximately 8,000 second-feet. The rainfall on the lower drainage area during the month of September was the greatest of any record in the past 40 years. This occurred in the Black Range, to the west of the river, and produced a discharge in several of the large arroyos, which combined in the Rio Grande and resulted in a flow of 11,200 second-feet at Percha Dam.

Simultaneous with the rise at the Percha diversion dam discharges from other arroyos reached the river below and caused a rise at Leasburg diversion dam, which is 60 miles above El Paso and about the same distance below Elephant Butte. The combined discharge at Leasburg diversion dam measured 16,900 second-feet, and this amount continued for approximately 12 hours. At El Paso, Tex.,

the increased discharge was recorded at noon, September 1, and gradually reached a peak of 13,500 second-feet, which continued for four hours in the morning of September 3. These discharges are higher than any previous recorded discharge at Leasburg Dam and at El Paso, Tex., since the completion of the Elephant Butte storage dam in 1916. The Rincon Valley, which lies directly below Percha diversion dam, was only slightly affected by the flooded river condition. In the Mesilla Valley, which lies between Leasburg diversion dam and El Paso, an estimate of

the flooded area is about 4,500 acres, largely outside of the ordinary flood bank of the river and in low lands. Constructed lateral levees and other flood protection works were successful in preventing an overflow of a larger area in the Mesilla Valley. At El Paso the main Franklin Canal banks were overtopped in places and for a limited time an uncontrolled discharge passed down the canal, overflowing into a small area in the lower portion of the city of El Paso. In the southeastern portion of El Paso, in what is known as the Collingsworth and Samburg additions, a large amount of damage was sustained to suburban homes by breaking of the city levee, and an area of 600 or 700 acres of well-improved suburban property was submerged in several feet of water.

Throughout the El Paso Valley several low-lying areas, particularly on the San Elizario Island, were overflowed and crop damage sustained. The total damage is estimated at between \$400,000 and \$500,000, over 50 per cent of which was sustained in homes and buildings in the lower portion of El Paso.

Exceptional and noteworthy measures were adopted by landowners and water users in the farming area in organizing emergency crews for levee raising and strengthening. A great deal of effective work was performed in this manner and prevented a much larger crop damage and loss to improvements. Army troops from Fort Bliss joined the city, county, and other agencies in quick response for flood emergency work, and at one time more than 1,000 men were engaged in patrolling and strengthening levee embankments.

Approximately 17,000 acres of the total

(Continued on page 174)



Growing cabbages in a pear orchard on the Rio Grande project, New Mexico-Texas

## CROP AND LIVESTOCK CENSUS

### Regulations

**PERSONNEL.**—The crop and livestock census for the year 1925 on Federal reclamation projects will be taken by employees of the bureau under the direction of the project superintendent. The methods employed will be similar to those followed during the years previous to 1924. (In 1924 the Bureau of Reclamation also took the census for the Bureau of the Census. This will not be done in 1925.)

**Census forms.**—The record forms to be used by the enumerator will be the usual Bureau of Reclamation Form 7-332, which has been modified to include information on purebred and scrub sires and the number of brood sows kept on farms. The Washington office of the Bureau of Reclamation has a supply of these forms on hand and the various projects should request the number required for this year. Old forms that may be on hand should not be used. The form enumerates most

varieties of crops produced and stock kept on Government projects. Blanks are provided on the form for listing additional items. Autos, trucks, and tractors should be listed and valued separately from other farm equipment which should be lumped and valued.

### IRELAND PLANS FARMS SUBSIDY

*A recent press dispatch from Dublin states that the Government of the Irish Free State proposes to grant a subsidy of \$15 an acre a year for all new land put under tillage. This action is to be taken to encourage the development of farming for other than domestic requirements. The Government is said to be prepared to back its plan to the extent of \$5,000,000.*

*At a conference of delegates of county agricultural committees, the plan was subjected to some criticism, on the ground that it was unjust that farmers who had hitherto entirely neglected tillage should receive a subsidy for the future, whereas those who had struggled with it through long years should be excluded from its benefits.*

**Accurate records.**—The Bureau of Reclamation has found the crop and stock census data taken annually in past years to have great value for reference. Under the act of December 5, 1924, which provides for the repayment of construction costs on the basis of gross crop values, these census data become of paramount importance and should be collected with a great deal of care. The enumerators should interview the farmer and secure his cooperation if possible. Absentee owners and other conditions will necessitate the use of good judgment based on the best information obtainable. Form 7-332 should be dated and signed by the owner where possible, otherwise by the enumerator.

**Supervisor.**—The project superintendent shall be the supervisor of the census and shall appoint the enumerators and review their work. He will confer with the leading business men and water users of the district and will determine the values to be applied to the various crops. He will then have prepared, under his direction, the necessary summaries of all data collected.

**Information shown.**—The crop census shall show with respect to each farm the total number of irrigable acres, the number of acres of the various crops grown, the yields per acre, and the values of such crops. Supplemental data showing whether the crops were sold, fed, or stored should be given.

**How to value.**—Many farmers will not have sold their crops; then the enumerator shall place a value upon such crops in accordance with the unit prices as fixed in general by the supervisor; others will have fed hay and grain to livestock and the value of such crops shall be determined as if the crops had been sold. Hay, fodder, or other harvested forage shall be valued in the stack on the farm. Crops, such as grain, beans, potatoes, seeds, etc., shall be valued f. o. b. cars, shipping point, exclusive of the cost of containers. Fruits, berries, and vegetables shall be valued f. o. b. cars, shipping point, or warehouse, exclusive of the cost of grading, packing, storing, and containers. All factory crops, such as sugar beets, string beans, cucumbers, tomatoes, etc., shall be valued at the selling price to factories or dealers (including estimated bonuses) f. o. b. shipping point, when not delivered direct to the factory. Grain crops which were not harvested for hay or grain should be included as pasture. A distinction should be made in value between tame and wild irrigated pasture and the value should be a reasonable annual rental for such pasture. Straw, sugar-beet tops, hay and grain stubble, etc., and other by-products should be listed and valued. All gardens and miscellaneous crops should be listed and valued.

## RIO GRANDE FLOODS

(Continued from page 173)

project area were overflowed. In the past years previous to the construction of Elephant Butte Dam three times this area has been subject to overflow with a smaller discharge.

Plans for river rectification throughout the El Paso Valley are receiving consideration from all interested agencies and endeavors are being made to remove the complications which arise through the international features involved, where the Rio Grande is the international boundary line between the United States and Mexico. Flood protection measures which in the past several years have been discussed with only ordinary interest most likely now will be vigorously adopted. The extension of the farming area has been so greatly increased in the past few years that former overflows of little consequence now are of greater moment on account of character of improvements and the rapid settlement which is taking place.

Total crop loss on account of the August and September floods to the project will be only on a small percentage of the project lands. The gross value of crop returns for the season of 1925 will be largely in excess of any heretofore produced and will most likely exceed the gross return of 1924, which was \$97 per acre for each acre cropped.

## CONGRESSMAN SMITH LAUDS IDAHO CROPS

Congressman Addison T. Smith, of Idaho, believes that Idaho agricultural land is better than any elsewhere in the world. On his return from an extensive trip over the reclamation projects he is reported to have said:

Prosperity has come to Idaho. Our agricultural yields have increased enormously. Farmers are reaping the biggest crops they have seen in years, and incidentally they are paying off obligations which three years ago they thought they never would be able to meet.

There is every reason to believe that the West, and particularly Idaho, has completely recovered from the postwar deflation, and is once more on the threshold of a position of agricultural and stock-raising equality with any community the world over.

No project that I have seen has seemed as productive as the Boise reclamation project, and the people of Idaho are fortunate in having that area within their boundaries.

## WATER USERS SAVED FURTHER SUM

**T**HE act of December 5, 1924, provides "that the cost and expense after June 30, 1925, of the main office at Washington, District of Columbia, of the Bureau of Reclamation in the Department of the Interior, and the cost and expense of general investigations heretofore and hereafter authorized by the Secretary, shall be charged to the general reclamation fund and shall not be charged as a part of the construction or operation and maintenance cost payable by the water users under the projects."

The cost of the Washington office and special investigations authorized by the Secretary, by fiscal years, for the last five years is given in the following table:

1921.....	\$225, 110. 57
1922.....	170, 830. 34
1923.....	150, 670. 08
1924.....	184, 345. 37
1925.....	162, 215. 81
<b>Total.....</b>	<b>\$893, 172. 27</b>

This is an average annual cost for this period of \$178,634.45. Under the former method of prorating these charges, the various projects were charged during the

fiscal year 1925 approximately as shown in the accompanying statement:

State	Project	Amount
Arizona-California.....	Yuma.....	\$7, 750
California.....	Yuma Auxillary.....	1, 100
Colorado.....	Orland.....	850
Idaho.....	Grand Valley.....	5, 150
	Uncompahgre.....	3, 450
	Boise.....	7, 650
	King Hill.....	1, 000
	Minidoka.....	3, 650
Montana.....	American Falls.....	18, 700
	Huntley.....	1, 200
	Milk River.....	3, 200
	Sun River.....	2, 400
	Lower Yellowstone.....	1, 950
Montana-North Dakota.....		
Nebraska-Wyoming.....	North Platte.....	21, 800
Nevada.....	Newlands.....	5, 300
New Mexico.....	Carlsbad.....	1, 000
New Mexico-Texas.....	Rio Grande.....	12, 000
North Dakota.....	Williston.....	1, 150
Oregon.....	Umatilla.....	10, 150
Oregon-California.....	Klamath.....	8, 000
South Dakota.....	Belle Fourche.....	2, 250
Utah.....	Strawberry Valley.....	1, 650
Washington.....	Okanogan.....	1, 200
	Yakima.....	15, 150
Wyoming.....	Riverton.....	8, 550
	Shoshone.....	6, 250
	Secondary projects and investigations.....	9, 700
<b>Total.....</b>		<b>162, 200</b>

Assuming that the average annual cost of the Washington office will be \$175,000, the provision of the act of December 5, 1924, quoted above, will result in an

## IRRIGATED PASTURE FINE FOR DAIRYING

The idea that irrigated land is too valuable for pasture is evidently disappearing, according to the numerous inquiries concerning pasture for cows received at the irrigation branch experiment station at Prosser, on the Yakima project, Washington.

Numerous irrigated pastures have been carrying from one to three cows per acre from six to seven months each year. Owners of good pasture estimate that an acre of grass is worth fully as much as an acre of alfalfa hay, soil and fertility considered. Experience at the Irrigation Station indicates that well-managed pasture on good land is highly satisfactory.

Cows are effective stabilizers in many communities. The extensive use of pastures in most of the leading dairy regions is significant. Grass is a natural feed for cattle, and important in health as well as in nutrition.

annual saving to the water users of amounts approximately as shown above.

Special investigation under subsection K of the act of December 5, 1924, by the board of survey and adjustments, for which Congress appropriated \$150,000, are now in progress. The cost of these investigations will be borne by the general reclamation fund.

## BOARDS APPOINTED TO SELECT SETTLERS

Subsection C of the act of December 5, 1924, provides for the selection of settlers on public land, based on qualifications as to industry, experience, character, and capital. The act authorizes the Secretary of the Interior to appoint boards, in part composed of private citizens, to assist in determining such qualifications. Regulations governing the selection of settlers under this act were printed in the October issue of the NEW RECLAMATION ERA.

At the time of going to press the following boards had been appointed:

**Klamath project.**—W. C. Dalton, Malin, Oreg.; C. A. Henderson, Klamath Falls, Oreg.; H. D. Newell, Klamath Falls, Oreg.

**Grand Valley project.**—M. G. Hinshaw, Route 4, Grand Junction, Colo.; W. A. Knapp, Mack, Colo.; J. C. Page, Grand Junction, Colo.

**Uncompahgre project.**—L. J. Foster, Montrose, Colo.; W. G. Merritt, Delta, Colo.; J. J. Tobin, Montrose, Colo.

All these boards will serve without compensation, other than the personal satisfaction of helping materially to build up the community.

## PROFITS FROM THE DAIRY COW

**T**HE dairy farmer stands to make a profit. A profit can be defined as a surplus above the cost, including his own wages, of conducting his farm.

Usually crop farmers get off well if they manage to cover their wages; not usually do they put financial fat on their bones, nor escape the responsibility incident to paying their debts throughout their lives. Their production begins and ends with production of raw materials.

There is, however, one universal lesson to be drawn from the industrial world. The producer of raw material gets wages; while the manufacturer gets a salary, and in addition as a reward for the employment of capital, a profit. His possession or control of the capital his business requires, is either a result of saving or a consequence of having a reputation for honesty and thrift. And any farmer can by the use of honesty and thrift command the use of sufficient capital to become a manufacturer—a manufacturer of his own raw materials for which his cows are his machinery.

Profit from use of machinery is always legitimate, usually substantial, and, reading from statistics, seldom lacking. Machinery is a tool for accomplishing the work of many hands by means of ingenious devices. The ingeniousness of men necessary to devise machinery is a rare quality and is recognized in patents and in the monopoly of patents. The farmer, whose ingeniousness enables him to select the best cows and make the best use for his by-product, manure, devises thereby the best manufacturing machinery for his crops and, other things being equal, makes the best profits.

He therefore enjoys something beyond his wages. This profit accumulated and saved becomes his capital and the means of retirement when age prompts it, the source of ease when age compels it, the means for starting his children in conditions above his own when their enterprise merits it.

We therefore recommend dairy farming for every enterprising farmer who would take advantage of his opportunities.



## NEW RECLAMATION ERA

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To other than water users the subscription price is 75 cents a year, payable in advance.

Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C., and remittance in the form of postal money order or New York draft should be made payable to the Special Fiscal Agent. Postage stamps are not acceptable in payment.



A 2½-year old grapefruit tree on the Yuma Mesa

## KLAMATH COUNTY FAIR, 1925

**T**HE annual Klamath County fair was held in Klamath Falls, Oreg., on September 3, 4, and 5.

C. A. Henderson, county agent, states that from the standpoint of exhibits the fair this year showed the largest increase and was the most successful to date. Livestock exhibits were not up to normal, but this was more than balanced by the large display of farm products. Owing to the prevailing low price of hogs during the last few years until the past six months, the hog exhibit was the smallest in the history of the fair. Sheep exhibits were slightly smaller than last year.

The exhibit of beef cattle was better balanced than ever before, quality show-

ing marked improvement. Dairy cattle were slightly less than last year, the total entries numbering 76 head. The quality was better than usual and better care was given those exhibited. The main livestock barn was practically filled with beef and dairy cattle.

Classes of baby beef were shown for the first time in the history of the fair. The two winning animals were sold at public auction and brought 17 and 11 cents per pound, respectively.

The poultry exhibit, numbering 100 entries, was by far the best ever shown. One hundred and twelve new collapsible-wire double-exhibit cages were purchased by the fair board, making as fine an exhibit for the department as any county fair in the State. A rabbit department was also added this year, showing 40 head of pure-breds and a score of utility rabbits.

The display of farm crops and fruit was exceptionally good, the number of entries over previous fairs being double in these departments. The quality of all produce was considerably above normal in every respect. Sugar beets weighing from 4 to 6 pounds were exhibited in large quantities. This is the first year that the growing of this crop has been undertaken.

However, perhaps the outstanding exhibit of the entire fair was the potato booth, inaugurated this year for the first time. In addition to a large number of exhibitors showing 15-pound lots, 18 sacks of hand-picked commercial Netted Gem potatoes were shown in competition for special prizes aggregating more than \$250. This division was judged by two judges,

who were unanimous in their opinion that it was the finest potato exhibit ever shown in the State of Oregon.

Prizes were offered this year by the fair board for the first time on the community booths, resulting in five communities in the county entering this contest. The booth displays were exceptionally good, considering this was the first year it was attempted.

A great diversity of products was shown in some of the booths, ranging from all kinds of fruits and vegetables to grains, grasses, clovers, and other farm products of every description produced in temperate climates.

Club work showed a 50 per cent improvement in the number of exhibitors, and the quality was exceptionally good. Domestic science and art, culinary service and flowers, all showed well-balanced exhibits, improving in quality and quantity over previous years.

## ANCIENT APPLE TREE GROWS RECORD FRUIT

Apples grown on a 26-year-old Rome Beauty tree on the Yakima project, Washington, and taking only 26 to fill a box, were displayed recently by the horticultural union. The apples were grown by M. N. Richards. On an average they measured 15¼ inches in circumference and weighed 1½ pounds.

T. S. Johnson, advertising manager of the union, used these apples as proof that old trees, properly cared for, can produce apples equal in size to those grown on any young tree. Right fertilization, combined with proper pruning and thinning, it is maintained, will keep the standard of fruit grown on the old trees equal to that grown on any.

## YAKIMA VALLEY CROPS GIVE GOOD RETURNS

The returns this year from farming operations in the Yakima Valley are reported as wonderful in many respects. Excellent yields are the rule rather than the exception. Listen to this one about the lowly spud:

Records for potato acreage returns are being broken right along this season at Sunnyside, with Ray Van de Veer as the latest to report an exceptional yield. Mr. Van de Veer was paid \$2,319 for his crop from 4 acres, an average of \$579 for each acre. The land was not especially prepared or heavily fertilized and received only ordinary attention.

Figure out what he would have made if he really had gone after a crop.



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# NEW RECLAMATION ERA

VOL. 16

DECEMBER, 1925

NO. 12



HARVESTING HAS BEEN COMPLETED OF LARGE AND, IN GENERAL, PROFITABLE CROPS ON THE IRRIGATION PROJECTS

## CREDIT

*THE credit problem of the farmer does not depend solely upon the availability of credit institutions that provide funds for farmers. Credit is based not only upon the security that is offered for loans but quite as much upon the character and ability of the borrower. It is important, therefore, that farmers so conduct their business that they establish good credit standing. Prompt repayment of loans when due, the efficient organization and management of the farm, and reputation for honesty and integrity are all important factors in giving farmers a good credit rating.*

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HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 16

DECEMBER, 1925

No. 12

## HIGH LIGHTS IN A REVIEW OF THE MONTH

**B**OISE PROJECT water users voted recently on the organization of the Boise-Kuna irrigation district, embracing about 45,300 acres of project land with a full Government water right and about 1,700 acres of New York Canal and Colonization Co. lands with a supplemental water right in Arrowrock Reservoir. The vote for the organization of the district resulted in 745 in favor and only 27 against.

**I**T is reported that the Southern Pacific Co. has granted an emergency freight rate on alfalfa hay in carload lots from Reno and Fallon, Newlands project, to eastern markets, effective December 15, 1925, for a period of six months. This should aid in disposing of surplus hay.

**R**EPRESENTATIVES of a large milk-condensing concern are understood to have been making an examination of the Newlands project with a view to establishing a plant or entering the local market for whole milk. With the number of producing dairy animals increasing very rapidly, the time for the establishment of a milk condensery is considered opportune.

**C**ARS loaded on one day at Grandview, Yakima project, included 17 cars of hay, containing 221 tons, valued at \$16 a ton; 20 cars of apples, holding 15,120 boxes, estimated at \$1.75 each; and 36 cars of potatoes, a load of 720 tons, with prices quoted at \$80 a ton. The value of this day's shipment alone would be \$3,536 for the hay, \$26,460 for the apples, and \$57,600 for the potatoes.

**A**FALL festival and fair was held on the King Hill project recently, at which a most complete exhibit was made of farm products. Garden vegetables of almost every variety known to the climate were exhibited, including some very fine specimens of melons. A large number of

varieties of apples of excellent quality were shown. The livestock exhibited was all of good quality and showed the effect of good care. The canned and baked goods sections contained a very interesting and instructive display, as also did the embroidery and needlework departments.

**T**HE majority of the water users generally are in better financial circumstances at the close of this year than they have been at any time since 1921. These conditions lead to a better attitude and feeling toward the United States, and it can safely be predicted that with another year or two of similar success the financial condition of many of the water users, which for the past four years has been somewhat precarious, will be greatly improved and more firmly established.

**F**IVE bids were received for the purchase of the Williston project, the highest being from the United Power Co., of Crosby, N. Dak., of \$151,388, to be paid in 20 annual installments of 5 per cent each, with interest at 6 per cent. The sale has been authorized by the Secretary.

**A**TRIP was made recently by Superintendent Preston and others of the Yuma project to the lower Imperial Valley to inspect rice growing with a view to the possible introduction of this crop on the project in order to further stimulate leaching out of the salt lands on the project.

**A**DVANCE reports concerning the experimental growing of cotton on the Orland project were favorable. A complete report on the crop will appear later in the NEW RECLAMATION ERA.

**T**HE tomato harvest on the Grand Valley project was the largest in the history of the local canning companies and taxed their facilities to the limit. One company in Grand Junction preserved

175,000 cases of tomatoes, 200 tons of pumpkins, 500 tons of apples in the form of apple butter, and a large quantity of string beans. A feeling of optimism is very apparent on the project.

**T**HE Newlands project has enjoyed one of the most prosperous potato seasons in the history of the State. Cantaloupe growers were well pleased with the returns from melons, particularly in the Fernley district.

**T**HE cotton yield on the Rio Grande project was the best in the history of the project. The crop matured two or three weeks earlier than usual and opened up unusually well.

**H**ARVESTING has been completed on the Yakima project of probably the most abundant and profitable crops ever raised in the valley. The returns from potatoes were unusually favorable, with war-time prices prevailing. The shipment of farm products for October exceeded that of any previous month in the history of the project, with all warehouses packed to capacity.

**T**HE price of 63 cents a pound for butterfat on the Orland project was the highest paid to project dairymen for the past five years.

**T**URKEY buyers on the North Platte project were preparing to ship 10 or more cars of dressed turkeys from the valley. Prospects on the Newlands project were excellent for the profitable disposal of an unusually large crop of these holiday birds.

**T**HE Powell-Creamery, Shoshone project, purchased in October 6,400 pounds of butterfat and manufactured 8,000 pounds of butter and 100 gallons of ice cream. Other agencies purchased 3,300 pounds of butterfat, the price of which at the end of the month was 48 cents.

## MARKETING OF CROPS AND LIVESTOCK PRODUCTS

*What the projects are doing to increase the efficiency of their methods in growing and disposing of their crops through cooperative organizations and concerns for changing raw products into a more concentrated form*

**I**N order that the Bureau of Reclamation and the water users might have readily available data to be used as the basis for a comprehensive plan to foster better marketing methods on the projects and the production of crops from which the largest returns may be obtained, the project superintendents were requested recently to furnish the following information:

1. List of cooperative organizations or groups of farmers associated for marketing agricultural products.

2. List of organizations or individuals who contracted during the past year with the water users for growing specified crops, and the acreage and value of crops so contracted.

3. List of manufacturing concerns on the projects for changing raw products into more concentrated form, such as creameries, cheese factories, sugar-beet factories, canneries, alfalfa meal mills, cotton gins, etc.

A number of projects have furnished the requested information and this is summarized in the following statements, a study of which will indicate the projects making the most of these aids to crop growing and marketing and where improvements can be made:

### COOPERATIVE ORGANIZATIONS

**Yuma project, Arizona-California.**—An association for marketing alfalfa, hay, seed, and straw; a cooperative association for marketing cottonseed, whose aim is to hold up the price of the seed and to fatten cattle with the seed or meal whenever the conditions are favorable; an association for growing and packing vegetables and melons, but not for marketing.

**Orland project, California.**—An almond growers' exchange; an orange growers' association; a prune and apricot growers' association; a fig growers' association; a cheese and butter company; a milk producers' association.

**Uncompahgre project, Colorado.**—Three potato growers' associations; a livestock and produce company; a community flour mill.

**Boise project, Idaho.**—Two creameries; an egg producers and creamery company; an equity exchange.

**King Hill project, Idaho.**—There are no cooperative organizations or groups of farmers on the project associated for marketing agricultural products.

**Minidoka project, Idaho.**—Wool growers' association; cooperative potato mar-

keting association; egg producers' association; honey producers' association.

**Huntley project, Montana.**—No such organizations on the project.

**Lower Yellowstone project, Montana-North Dakota.**—Four farmers' grain elevators; a dairymen's association.

**North Platte project, Nebraska-Wyoming.**—Two farmers' unions; beet growers' association; cooperative potato growers' association; cooperative cheese company; poultry association.

### POTATO GROWERS MAKE EXCEPTIONAL PROFITS

*Yakima Valley potato growers have struck a veritable Klondike in the sale of the lowly spud this year. With the Nation's crop thousands of carloads short, buyers have been flocking to Yakima, with the result that prices have soared to unexpected heights. At the end of October prices had reached \$57.50 per ton, with prospects of going higher.*

*One water user is reported to have harvested \$1,200 worth of potatoes from his patch of 1½ acres, and at that sold his crop \$10 a ton under the latest quotation.*

*Growers in the Grandview-Sunny-side district have for the most part raised bumper crops of potatoes, and those who have been fortunate enough to hold their crop expect to realize an excellent profit.*

*The crop of 6,500 carloads, or 120,000 tons, is expected to bring the farmers of the valley the highest total in cash in the history of the project, amounting probably to more than \$5,000,000.*

**Carlsbad project, New Mexico.**—A ginning company, composed of 40 farmers associated for the purpose of ginning and marketing cotton and cottonseed. It is proposed to extend the operations to alfalfa products.

**Umatilla project, Oregon.**—A melon growers' association; an association of poultry producers, of which most of the poultry raisers on the project are members; a growers' association which has an agreement with a Washington association to market asparagus, potatoes, and strawberries grown on the project by members of the association.

**Klamath project, Oregon-California.**—Farm bureau exchange; potato growers'

association; poultry producers' association; wool producers' association. None of these organizations are extremely active, but are working more toward standardization than actual marketing.

**Belle Fourche project, South Dakota.**—There are no organizations on the project that function primarily as agencies for marketing agricultural products. Associations of alfalfa-seed growers, certified seed-potato growers, and for the marketing of wool have, however, been the means of disposing at times of a small portion of the products raised on the project.

**Strawberry Valley project, Utah.**—Three fruit growers' associations (no fruit shipped this season); a dairy association; two wheat growers' associations (inactive); two marketing associations; a poultry association.

**Okanogan project, Washington.**—A growers' union; a cooperative warehouse; a growers' warehouse company.

**Yakima project, Washington.**—Four fruit growers' associations; fruit exchange; horticultural union; grape growers' union; two cantaloupe growers' associations; cantaloupe exchange; a growers' association; dairymen's association; sweet potato exchange; beekeepers' association.

**Shoshone project, Wyoming.**—An association for the cooperative marketing of crops and livestock products.

### CROP CONTRACTING ORGANIZATIONS

**Yuma project.**—A commission house contracted with growers of melons and lettuce and handled the produce on a commission basis. The acreage and returns were as follows:

Crop	Acreage	Gross returns
Lettuce.....	200	\$50,000
Watermelons.....	200	30,000
Cantaloupes.....	400	56,000

The net returns on lettuce and watermelons were quite satisfactory, but the cantaloupe crop was considered to be very poor.

**Orland project.**—No crops contracted for.

**Uncompahgre project.**—A sugar company contracted for 5,500 acres of sugar beets, the gross returns from which are estimated at \$385,000. A canning company contracted for 2,000 acres of string beans, with estimated gross returns of \$45,000. Some acreage was also planted to alfalfa seed and cucumber seed under contracts with seed companies.

**Boise project.**—There are no organizations or individuals on the project who contracted during the past year with the water users for growing specified crops. There are, however, a large number of fruit, vegetable, and seed buyers who either maintain permanent headquarters on the project or who have representatives there during the shipping season. Three concerns buy clover and alfalfa seed. Two fruit companies are heavy buyers and shippers of fresh fruits. Two packing companies have cold-storage plants for packing and shipping poultry.

**King Hill project.**—No crops contracted for.

**Minidoka project.**—A sugar company contracted for 8,000 acres of sugar beets at \$6 per ton; 200 acres of potatoes were contracted at 65 cents per hundredweight.

**Huntley project.**—A sugar company contracted for the growing of 4,669 acres of sugar beets. The contract price of beets is \$6.50 per ton, and an average yield of about 10 tons per acre will be harvested, which will return \$303,485 to the water users.

**Lower Yellowstone project.**—A sugar company contracted for 7,500 acres of sugar beets, estimated to return \$500,000. A pickle company contracted 550 acres of cucumbers, with an estimated return of \$20,000. A seed company contracted 1,850 acres of seed peas, estimated to return \$50,000.

**North Platte project.**—Two sugar companies contracted 63,000 acres of sugar beets, estimated to return a crop valued at \$4,851,000. A pickle company contracted 500 acres of cucumbers, with an estimated return of \$40,000. A seed company contracted 18 acres of cucumber seed. The above crops are produced in the valley, but not all on the project.

**Carlsbad project.**—No crops contracted for.

**Umatilla project.**—No crops contracted for.

**Klamath project.**—The acreage of potatoes contracted amounted to 1,000 acres, with an estimated value of the crop of \$100,000. Wool to the value of \$240,000 was contracted. A sugar company contracted 500 acres of sugar beets, with an estimated crop value of \$40,000. Contracts were made with lettuce growers for 100 acres, with an estimated crop value of \$20,000. Some hay and grain acreage was also contracted, but definite figures are not available.

**Belle Fourche project.**—A sugar company contracted about 1,500 acres of sugar beets which will yield about 20,000 tons. The fixed price without bonus is \$6 per ton but it is believed that \$7 can safely be taken as the ultimate price, giving a total value of \$140,000. A pickle company

contracted 150 acres. This crop returned about \$200 per acre, or a total of \$30,000. It is expected that this industry will be expanded 100 per cent next year.

**Strawberry Valley project.**—Two organizations contracted for 1,010 acres of peas, at an estimated value of \$86,080; 123 acres of string beans at an estimated value of \$15,540; and 400 acres of tomatoes at an estimated value of \$37,950. Two sugar companies contracted for 7,492 acres of sugar beets at an estimated value of \$775,000. Forty acres of head lettuce were contracted, and a few small scattered acreages by a seed concern.

**Okanogan project.**—No crops contracted for.

**Yakima project.**—About 150 acres of squash were contracted, with an estimated value of \$14,400. Two companies contracted for 275 acres of cucumbers for pickles, with an estimated crop value of \$45,000.

**Shoshone project.**—A seed company sent a representative to the project the latter part of 1924 and early in 1925 and secured contracts for growing seed peas and seed beans, as follows:

Crop	Acreage	Gross returns
Peas.....	550	\$14,000
Beans.....	500	30,000

## UNCOMPAHGRE PROJECT PRODUCES FINE CROPS

Recent figures compiled by Prof. W. H. Olin, superintendent of the department of agriculture of the Denver & Rio Grande Western Railroad, call attention to the success of the project this year from an agricultural standpoint. More than 25,000 acres of alfalfa produced more than 100,000 tons of hay, worth in excess of \$1,000,000. Irish potatoes were grown on 15,000 acres and produced 3,000,000 bushels, worth to the farmer more than \$3,000,000.

The third most important crop on the irrigated lands of the project is wheat, of which there are 10,000 acres with an average yield of 40 bushels per acre, making 400,000 bushels worth \$500,000 to the farmer. The fourth most important crop is sugar beets, of which there are 6,500 acres, with a production worth to the farmer about the same as the total wheat crop, or possibly over \$500,000. The fruit lands show a return to the owners of \$250 to \$400 per acre.

Including the returns from oats, barley, onions, hogs, cattle, sheep, and poultry, "the total for the year will run well over \$7,000,000, which is about equal to the entire cost of the project."

## MANUFACTURING CONCERNS

**Yuma project.**—One creamery; 1 cotton-seed mill; 12 cotton gins.

**Orland project.**—Two creameries; an alfalfa meal mill; a canning and preserving plant.

**Uncompahgre project.**—Three flour milling companies; 2 creameries; 1 sugar company.

**Boise project.**—One cheese factory; 5 creameries; 1 canning company.

**Minidoka project.**—Two sugar factories; 4 cheese factories; 1 cheese factory; 2 butter factories; 2 alfalfa meal mills; 3 flour and feed mills; 1 flour, feed, and seed cleaning mill.

**Huntley project.**—One creamery.

**Lower Yellowstone.**—Two creameries, making butter, cheese, and ice cream; a sugar factory; an alfalfa meal mill; two flour mills.

**North Platte.**—Five sugar factories; 2 creameries, a cheese factory; a milling company. There are several receiving stations in the various towns where butterfat is collected and shipped to outside points.

**Carlsbad project.**—Six cotton gins.

**Umatilla project.**—One creamery; 1 alfalfa meal mill; 1 apple packing and shipping plant.

**Klamath project.**—Four creameries; a cheese factory; two flour mills. The total value of all manufactured and raw products handled is estimated at \$700,000.

**Belle Fourche project.**—One creamery.

**Strawberry Valley project.**—Two sugar companies; a packing company; a dairy; and a poultry association.

**Okanogan project.**—Two creameries; a plum evaporator.

**Yakima project.**—Eleven creameries; 2 canneries; 5 evaporators; 3 alfalfa mills; 7 flour mills; 3 vinegar factories; 13 cold-storage plants; 28 commercial packing and common storage companies, non-cooperative; 35 fruit shippers, packing, and common storage companies in Yakima.

**Riverton project.**—One creamery.

**Shoshone project.**—Two alfalfa mills; a sugar company; a creamery. The farmers received \$53,040 for hay ground, \$216,095 for sugar beets, and \$35,229 for cream.

The land irrigated from Federal reclamation works in 1924 produced crops worth nearly \$110,000,000. This is an increase from the previous year of more than \$7,000,000. The value of crops grown in 1925 will be considerably greater than in 1924.

The amount of water that can be best handled will depend upon the kind of irrigation system that is to be used.



## SUGAR BEETS AFFORD OPPORTUNITY FOR PROFITS

*Much remains to be done to increase the per acre tonnage from the present relatively low point to that of other irrigated areas where the farmers keep dairy cattle or sheep and follow an approved crop rotation*

*By George C. Kreutzer, Director of Reclamation Economics*

**S**UGAR beets are grown on 12 of the more northern reclamation projects. In 1915, 20,848 acres were grown with an average yield of 11 tons an acre. In 1922 the acreage was 29,654 and the average yield 11.7 tons an acre. In 1924 the acreage increased to 67,123, but the yield dropped to an average of 8.6 tons an acre. It is believed the lower yield in 1924 was caused by the dry season and in some cases a shortage of water.

The accompanying table shows the comparative areas on Federal reclamation projects, yields, and other information relating to this crop during the years 1915 to 1924, inclusive.

The agriculture of these more northern projects largely centers around alfalfa, with small grains, sugar beets, and potatoes as other major crops and lesser acreages of onions, beans, fruits, and vegetables. Because of the character of the leading crops, livestock plays an important part in the marketing of them. Alfalfa is the chief forage grown on these projects and the best results are obtained when it is fed to livestock. Small grains and corn, where they can be successfully grown, are valuable adjuncts to alfalfa for fattening purposes. To these feeds,

sugar-beet tops and sugar-beet pulp add a variety of cheap feed of value.

Project farmers are generally most successful when livestock are kept on farms in sufficient numbers to consume the alfalfa, grain, and beet tops grown, supplemented by beet pulp where it can be procured easily and cheaply. This combination forms a balanced agriculture because it gives animal fertilizer for application to the fields, thus maintaining and even increasing yields; maintains a large portion of the farm in alfalfa, which in

itself is a nitrogen gatherer as well as being a more or less permanent crop, provided crops, such as grains, follow alfalfa after it is broken up, thus filling the gap between sod lands and an intensively cultivated row crop, and finally adding that row crop in the way of sugar beets as a cash crop of high returns.

Satisfactory yields of sugar beets can be obtained only by clean and intelligent tillage methods. Attention must also be given to the best plan of crop rotation and the application of animal fertilizers to the fields. How important these things are can be gleaned from the results obtained at Belle Fourche last year. A crop rotation was practiced in which the land was in alfalfa from 3 to 4 years, the following year corn, then sugar beets, followed by oats, and finally replanted to alfalfa when the rotation would be repeated. Sheep were used to consume the alfalfa, corn, and beet tops. This provided manure for the fields. The crop harvested amounted to 20 tons of sugar beets an acre. The soil at the beginning of the rotation was not as good as the average of the district, yet the yield of sugar beets was double the average for the district. Nothing was done in this case that could not be done on any irrigated farm in that locality. An 80-acre farm, under such a rotation, would have from 40 to 50 acres always in alfalfa, about 10 acres each of corn and small grain, and 10 acres of sugar beets.

Various analyses have been made which indicate that it takes from 8 to 10 tons of beets an acre to pay the cost of production. These figures, however, allow the farmer wages for the work he performs. A study of the table given indicates that the profits of the reclamation farmers

*Sugar beets on Bureau of Reclamation projects, 1915-1924*

Year	Acreage cropped		Yield (tons)		Value		
	Total	Per cent of total cropped acreage	Total	Average per acre	Total	Average per acre	Per cent of total crop value
1915.....	20,848	2.7	225,854	11.0	\$1,236,049	\$59.00	6.8
1916.....	29,328	3.5	306,506	10.5	1,881,449	64.00	5.7
1917.....	32,924	3.4	318,471	9.7	2,275,338	69.00	4.0
1918.....	27,133	2.6	267,130	9.9	2,731,871	101.00	4.1
1919.....	37,964	3.4	357,977	9.4	3,805,379	100.24	4.3
1920.....	47,160	4.1	455,180	9.6	5,486,251	116.33	8.3
1921.....	40,895	3.5	423,442	10.3	2,690,001	66.00	5.4
1922.....	29,654	2.6	346,627	11.7	2,223,628	75.00	4.4
1923.....	54,777	4.7	548,162	10.0	4,274,852	78.04	6.6
1924.....	67,123	5.5	581,672	8.6	4,140,818	61.70	6.2
Average.....	38,781	-----	383,111	9.9	3,074,564	79.28	-----



A field of sugar beets grown on one of the irrigation projects

(Continued on page 181)

## TWO FEDERAL SOURCES OF CREDIT FOR THE FARMER

*Intermediate credit banks furnish a means for obtaining loans for a longer period than usual commercial short-time loans—The agricultural credit organizations*

**T**HE question of adequate credit is of vital importance to the water users on the irrigation projects, especially the ability to obtain loans at a reasonable rate of interest and for a period longer than that of the usual short-term loans of commercial banks. In the Yearbook of the Department of Agriculture, recently issued, a chapter is devoted to intermediate credit, from which the following is abstracted:

Farmers frequently need loans for longer periods than commercial banks can safely make. For the production and marketing of livestock, for example, they may need loans ranging from one to three years. The gap between short-term loans ordinarily made by banks and the longer time credit needed by farmers in their operations has been bridged in the past by the renewal of short-term bank loans. This policy of renewing short-term bank loans serves perhaps well enough when conditions are normal. When, however, such loans are called during periods of credit stringency, considerable hardship if not severe losses to farmers may result.

These and other influences led to the passage of the agricultural credits act in the spring of 1923. The principal object of this act was to establish a Federal credit system through which farmers could obtain production and marketing credit for periods longer than those ordi-

narily supplied by commercial banks. It was not the intention of Congress that the new system should supplant the commercial banks already serving farmers, but merely supplement these institutions in financing the needs of agriculture.

The act provided for the establishment of 12 intermediate credit banks with districts corresponding to those of the Federal land banks.

The intermediate credit banks do not make direct loans to farmers. Their advances are made either in the form of direct loans to farmer's cooperative marketing associations or in the discount of agricultural and livestock paper for banks, livestock loan companies, and other credit institutions. The direct loans which these banks make to cooperative marketing associations are secured by warehouse receipts or shipping documents on staple agricultural products. The following products have to date been declared eligible for loans: Corn, cotton, wool, tobacco, peanuts, broomcorn, beans, rice, alfalfa and red-top clover seed, hay, nuts, dried prunes, dried raisins, and canned fruits and vegetables. The intermediate credit banks have been able to make direct advances at rates ranging from  $4\frac{1}{2}$  to  $5\frac{1}{2}$  per cent.

The Federal intermediate credit banks may also discount for local banks, livestock loan companies, and other credit agencies agricultural paper with a maturity of six months to three years.

Provision has also been made for the organization of agricultural credit corporations in regions where established credit institutions do not provide farmers adequate credit accommodations. These agricultural credit corporations may be organized by any group of citizens. They are organized under State law and must have a minimum paid-up capital stock of \$10,000. The law provides that these corporations may rediscount agricultural paper with an intermediate credit bank up to ten times their capital and surplus. In some instances they have been established as subsidiaries of banks in order to relieve bank portfolios of slow agricultural paper. In other sections they have been organized by farmers and local business men for the purpose of providing a more ample supply of production credit. In still other parts they have been set up as subsidiaries of cooperative marketing associations with the purpose of providing production credit for the members of the association. Many of the cooperative marketing as-

sociations have found their activities restricted by the credit arrangements of their members. Crops that are mortgaged to local lenders must frequently be sold when harvested in order to pay maturing notes. To meet this situation a number of state-wide agricultural credit corporations have been organized by the cotton and tobacco cooperatives. Some of these corporations have been formed to supply production credit and others to finance the delivery of mortgaged crops. They should all serve to reduce the dependence of the farmer upon local sources of credit and give him greater freedom to market his crop through the cooperative association.

During the relatively short period of their existence the intermediate credit banks have made substantial advances both in the form of direct loans and in discounts. Up to the present the larger part of their advances have been made in the form of direct loans to cooperative marketing associations.

Through the establishment of the intermediate credit system a new channel has been opened through which intermediate credit for the production and marketing of crops may freely flow into all parts of the country. Loans are made to both owner and tenant farmers on terms and conditions that are liberal. Renewal privileges are freely granted and partial repayments at the option of the borrower are accepted. Through the sale of tax-exempt debentures the intermediate credit system should be able to provide adequate working capital for agriculture at reasonable cost and for suitable periods. The system has been in operation but a short time and it is too early to fairly appraise its work. While there remain many problems in the development and administration of the system, it is already apparent that the intermediate credit banks will admirably supplement the commercial credit institutions in providing for the credit needs of the farmer.

### SUGAR BEETS

(Continued from page 180)

have been small. One of the ways to increase the profits from this crop is to increase yields. This can best be done by good crop rotations, livestock on farms, better seed, and improved cultural methods.

In the Johnstown area in northern Colorado sugar beets have been grown continuously since 1904, and, while the soils were fertile to begin with, still the average yields have steadily increased from about 11 tons an acre to 15 tons an acre. Some of the most successful growers never expect less than 18 tons an acre. Without exception these farmers keep either dairy cattle or they feed large numbers of sheep, and in addition they have a uniform crop rotation of alfalfa, small grains, and sugar beets.

Much can be accomplished on the projects to increase the yields of sugar beets if the known good practices of older irrigation areas are adopted.

Pigs to be kept for breeding purposes should be fed with the whole object of making them stretch out and develop bone and muscle in place of fat.

After young gilts have been bred they must be fed a ration heavy enough to grow the litter and properly finish their own growth.

# GERBER DAM CONSTRUCTION, KLAMATH PROJECT, OREGON

Begun in 1924 and completed in 1925 at a cost, including the reservoir site, of \$386,000—Provides storage water for Langell Valley lands and controls flood waters of Miller Creek

By A. L. Darr, resident engineer

**G**ERBER DAM, built for the Klamath project, Oregon, was begun early in March, 1924, and completed June 1, 1925. It was constructed by contract, the contractor being W. D. Miller, of Klamath Falls.

The reservoir is located about 46 miles east of Klamath Falls, in the heart of the old cattle country of southern Oregon. It receives its impounded water from Miller Creek, one of the two main tributaries of Lost River. The area that will be submerged at spillway elevation is about 3,800 acres, with a storage capacity of 94,000 acre-feet.

The purpose of the reservoir is two-fold—to provide storage water for lands of Langell Valley lying adjacent to the lower portion of the Creek and to provide means of control of the flood waters of Miller Creek so they will be prevented from overflowing the bed of Tule Lake. These latter lands have been reclaimed

by the unwatering of Tule Lake, which is the outlet for Lost River. The unwatering was made possible by the construction of a storage dam at Clear Lake, and by the construction of a diversion channel through which the average discharge of Lost River can be diverted into Klamath River. With the completion of Gerber Dam the principal portion of the flow of Lost River is under control, and it is not probable that its flood waters in the future will reach the basin of Tule Lake in sufficient quantity to cause material damage.

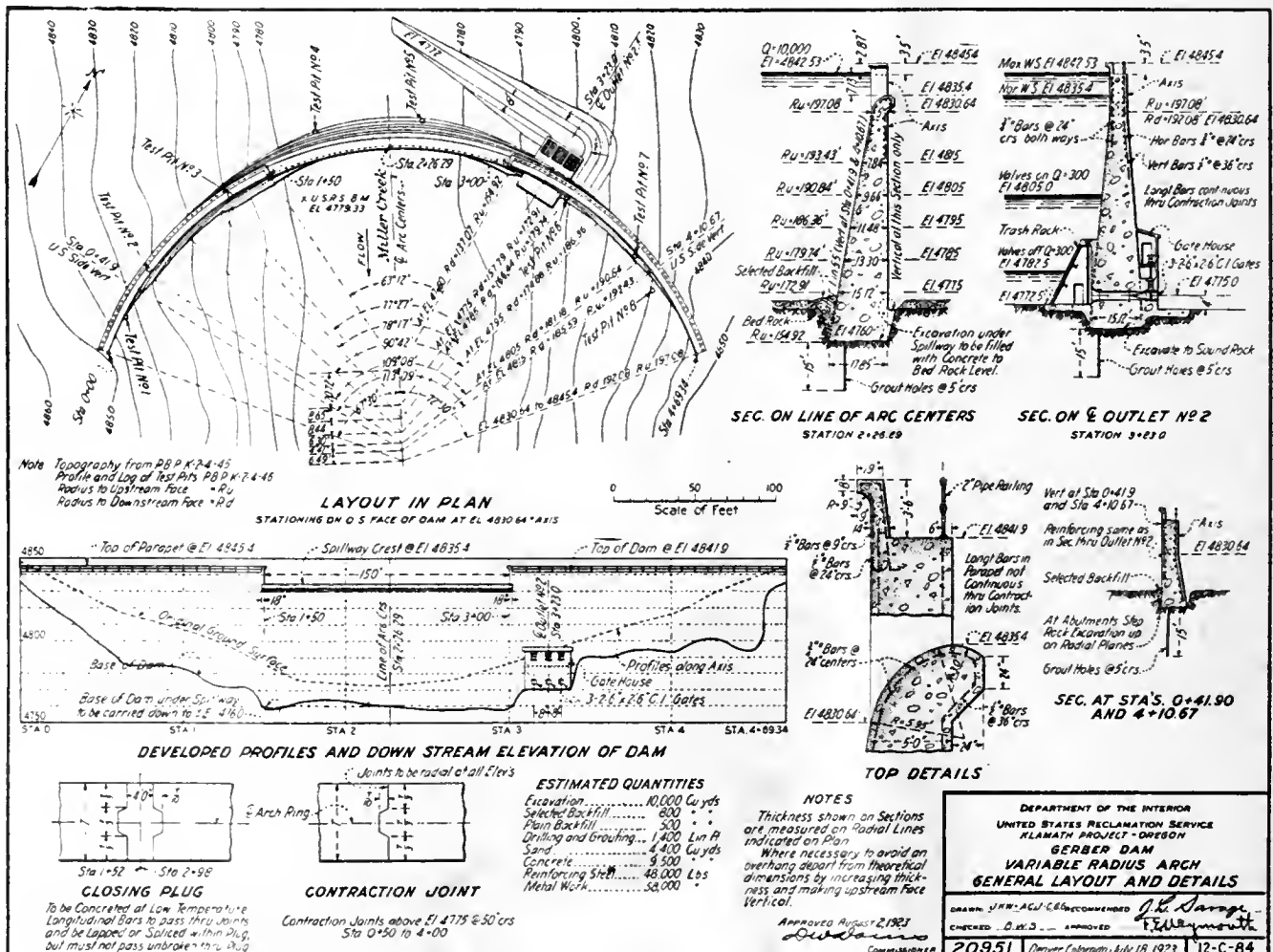
The dam is situated on Miller Creek at the upper end of a canyon, and is about 10 miles above the point where the creek enters Lost River. The walls of the canyon are generally steep and formed of seamy volcanic rock and boulders. The submerged area is largely meadowlands, and includes a large portion of the old Louis Gerber cattle ranch as well

as several smaller holdings. The drainage area contributing to the storage basin covers about 200 square miles, with an average precipitation of approximately 13 inches annually. One-half of the watershed is fairly well covered with timber, the remainder being devoid of any growth except sage brush and scattering junipers.

## DESIGN OF THE DAM

The dam is of the variable radius arch type, and is 150 feet in length at channel elevation, and 478 feet long at the top. The spillway crest is 60 feet above the stream bed and is 150 feet in length. The top of the 3½-foot parapet wall is 10 feet above the spillway crest. The capacity of the spillway with a 7-foot depth is 10,000 second-feet.

Excavation for foundations was carried about 18 feet below the stream bed. The portion of the dam constructed in forms



is 15 feet thick at stream bed elevation. The foundation trench across the stream bed averages about 24 feet in width and is filled with concrete. Five feet below the spillway crest the thickness of the dam is 5 feet, which dimension is carried to the base of the parapet wall, 14 inches in width.

Outlet works were installed near one end of the spillway, with trash rack above and operating house below. Conduit pipes are three in number, 36 inches in diameter and 21 feet in length. Cast-iron high-pressure gates, 30 by 30 inches, are installed at the downstream end of the conduits, which are hand operated by geared hoists. Air inlet and water by-pass pipes are installed near each gate.

#### CHARACTER OF FOUNDATION

The character of the dam foundation was carefully investigated before construction. Open test pits were used, and leakage tests were made with water under pressure, to test the water tightness of the foundation rock. Both the leakage tests and the open pits showed satisfactory lava rock for the foundation and abutments of the dam. The rock as then disclosed was not entirely homogeneous, but roughly stratified in layers of hard and soft lava. The lava was broken and seamy but the seams were generally tight and where crevices existed they were compactly filled with stiff clay.

Actual excavation confirmed the conclusions of the preliminary examination in general. However, the layers of hard lava disclosed by the test pits in many cases were found to be made up of loosely conglomerated boulders, often separated by clay-filled seams which disintegrated upon exposure. The soft layers were generally water-tight, but also disintegrated with exposure and yielded quite readily to a pick.

On account of the showing of the open cut it was considered necessary to carry the foundation well into the rock. As an additional precaution against the tendency of the water to cut a channel around the end of the dam in the soft layers, a keyway 2 to 3 feet in depth and of about the same width was cut into each soft layer. This was filled with concrete as the dam was poured. To further prevent the erosion of the soft material under

#### Cost of Gerber Dam and Reservoir

Excavation, 15,952 cubic yards, at \$3.....	\$47,856.00
Placing concrete, 11,888 cubic yards, at \$11.50.....	136,712.00
Selected backfill, 1,571 cubic yards, at \$1.25.....	1,963.75
Grouting foundation, 1,680 linear feet, at \$3.....	5,040.00
Placing steel reinforcement, 62,933 pounds, at \$0.06.....	3,775.98
Placing metal work, 78,067 pounds, at \$0.05.....	3,903.35
Manufacturing sand, 1,971 cubic yards, at \$6.55.....	12,906.20
Hauling sand, 3,832 cubic yards, at \$5.67.....	21,745.37
Extra work.....	1,366.44
Materials furnished by contractor.....	349.42

Total contract earnings..... \$235,618.51

#### MATERIALS SUPPLIED BY UNITED STATES

Cement, 16,068 barrels.....	\$48,896.80
Marysville sand, 603 cubic yards.....	1,614.80
Metal work and reinforcement.....	3,480.53
Outlet gates and conduit, 54,182 pounds.....	10,107.61
Pipe for grouting, 1,080 linear feet.....	662.17

64,761.91

#### MISCELLANEOUS EXPENDITURES BY UNITED STATES

Purchase of reservoir site, 1,800 acres.....	\$27,032.30
Royalty.....	500.00
Surveys, test pits, plans, estimates.....	11,691.58
Telephone line.....	2,698.50
Relocating and building 7 miles of county road.....	7,773.60
Drilled well 300 feet deep.....	2,759.62
Estimated cost, cottage, barn, and outbuildings for gate-keeper.....	6,000.00
Camp maintenance.....	1,136.02
Engineering and inspection.....	10,071.06
Superintendence and accounts.....	3,540.20
General expense.....	12,423.27

85,626.15

Total cost of storage works and reservoir site..... 386,006.57

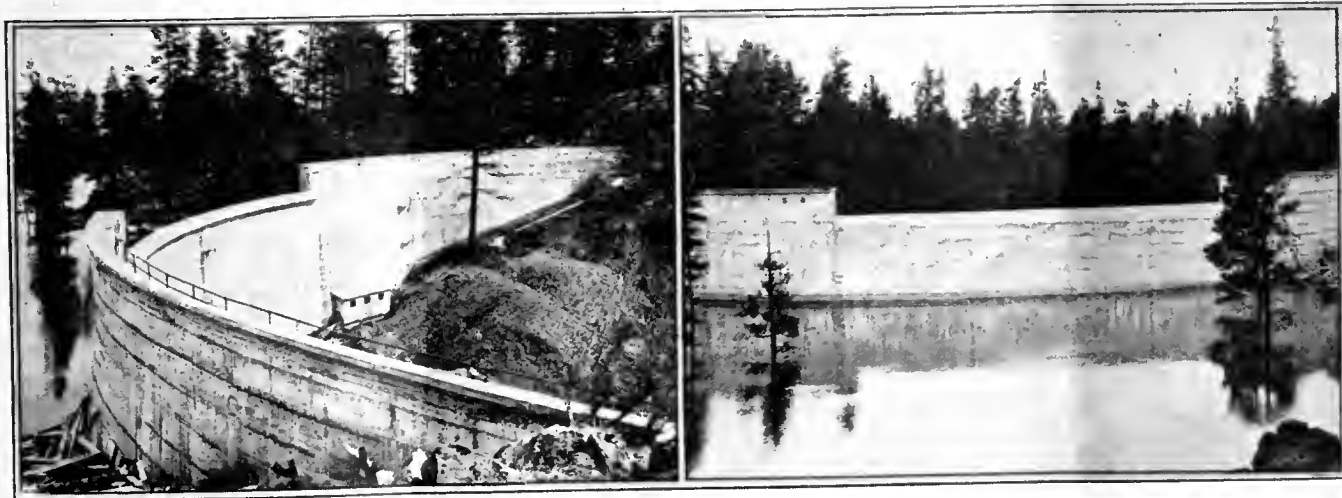
velocities due to reservoir heads, and to transfer a part of the thrust resulting from arch action to the walls of the excavation, forms were omitted and concrete poured against the walls wherever solid rock was encountered.

Although the rock, as before stated, was considered water-tight and proved so by test, the foundation was grouted as an additional precaution. Grout holes were drilled 5 feet apart throughout the length of the dam 2 inches in diameter and 15 feet in depth. Pipe 3 inches in diameter and 8 feet long were set in these holes, and after concrete had been poured to a depth of about 6 feet in the dam the holes were grouted under 100 pounds steam pressure. Other grout holes were drilled wherever a seam occurred in the foundation. In some cases three parallel rows of holes were used where the foundation seemed especially open; 200 sacks of cement were used to fill the 112 grout holes drilled. As many as 17 sacks were used in a single hole, 4 holes in one section of the foundation requiring 42 sacks. The amount used ordinarily was 1 to 1½ sacks to the hole. Where the foundation appeared noticeably poor, extreme precaution was taken in the way of omitting forms and filling the excavation section with concrete, for the purpose of securing arch action over the weak spots, and securing a better bond with the side walls of the cut.

#### POURING THE CONCRETE

The total amount of concrete placed in the dam was 11,888 cubic yards, utilizing 15,900 barrels of cement. About 125 barrels were used in grouting and for bond between pourings. The quantity of cement per cubic yard of concrete ranged from 1.28 to 1.50 barrels, according to the mix. The total amount of reinforcing steel required was 62,933 pounds, and metal work totaled 78,067 pounds.

(Continued on page 184)



Gerber dam, Klamath project, Oregon-California



## GERBER DAM CONSTRUCTION

(Continued from page 183)

Plum rocks were placed in the concrete where forms were not used and to provide a bond in joints between pourings.

Pouring was begun August 12, 1924, and by December 16, when pouring was discontinued on account of cold weather, 11,864 cubic yards had been placed. The remaining 24 cubic yards were placed in May, 1925. The amounts poured each month were as follows:

	Cubic yards.
August, 1924.....	1,900
September, 1924.....	4,730
October, 1924.....	3,362
November, 1924.....	1,589
December, 1924.....	283
May, 1925.....	24

Weather conditions were generally favorable for concrete work, special measures for protection being required during the cold weather of December. Materials were heated and concrete kept warm in the forms, so that no concrete in place was damaged by frost.

Forms used consisted of 4 by 8 feet wooden panels, faced with 20-gauge sheet iron. Two sets were used, the lower being lifted above and set on the plate of the upper as the work progressed. Pouring was thus conducted in 4-foot lifts. The forms were anchored by No. 8 gauge wires, doubled, to rows of wire anchors made of No. 6 gauge wire and 18 inches long. About 10,000 pounds of wire were thus used and left in the dam. Spreaders 2 by 12 inches were used on top of the 4-foot forms, cut to exact width at the level on which they appeared. These spreaders served as a guaranty that the forms would remain in place and that the required thickness of the dam would be secured. They served to reduce both the engineering and form work required, and acted as

joists for flooring when such was needed in the work. Channels 10 inches wide and 6 inches deep were left in each pouring joint to prevent leakage.

Hard, clean, igneous rock was secured adjacent to the dam site in sufficient quantities to furnish the required supply for concrete. Sand used consisted of various blends of local sand from three pits, basalt sand manufactured at the crusher plant, and sand shipped from Marysville, Calif. The haul from pit No. 1 was about 4 miles; that from pits 2 and 3 averaged about 17 miles. The length of truck haul for Marysville sand from the railroad siding to the dam site was about 27 miles. Various mixes were used, according to the blend, ranging from a 1:2:4 to a 1:2½:4½ mix. About 55 per cent of the sand used was local sand, 11 per cent Marysville, and 34 per cent manufactured basalt sand.

Slump tests were taken at regular intervals during the progress of the work. It was the intention to produce concrete of a consistency corresponding to a slump of 3 inches in the main body of the dam, a slump of from 6 to 8 inches being permitted in thin reinforced walls.

Cement and sand briquettes, and cylinders of concrete taken from the forms were also made regularly, to check tensile strength of the cement and for compression observations.

Contraction joints were maintained at intervals of 50 feet, with two closing segments 4 feet in width which were poured at low temperatures.

### EXPERIMENTAL APPARATUS

Apparatus was installed for the purpose of enabling a series of observations

leading to the underlying laws of the distribution of stresses in the dam. These stresses result from temperature changes, deformation from various causes, and deflection due to load. Seventeen thermometers were placed at three levels in the dam, at the center, distributed from face to face of the structure. These thermometers are electrically connected with a switchboard in the gatehouse. Nine deformation stations were placed on the downstream face of the dam and two on top. Those on the face provide eight measuring spans, and those on the top one each. Measurements will be taken at various water levels in the reservoir, and seasonal. For measuring deflection, four targets were set at different levels on the downstream face of the dam on the line of arc centers. Land targets were placed at one end of the dam, and a sliding transit base at the other. Lines of sight observed from a transit on the sliding base, through the targets on the dam, to the land targets, and compared for various reservoir levels, will provide means of determining presence of movement of the dam.

### PLANT EQUIPMENT

The crushing plant, storage bins, and mixing plant were located on the hillside above and near one end of the dam. The capacity of the crushing plant operating 16 hours was about 140 yards of rock, 25 yards of which was made into basalt sand. About 7,000 cubic yards were poured by gravity by means of chutes and pipes. The remainder was carried by chute to a hopper in the stream bed and reelevated by steam hoist to a high line. The concrete was carried on the high line in a bucket supported by a traveler. The bucket dumped directly into forms or chutes.

Three and one-half per cent of the sand listed was used in grout for priming new pourings and as waste in rejected and spilled concrete around the bins and plant.

About 17,000 acre-feet of the spring run-off was stored. The maximum water surface behind the dam reached an elevation of about 35 feet above the level of the creek bed and about 25 feet below the spillway crest. At first there was a little leakage through the concrete in a few places, all of which practically ceased in a few weeks. There was no visible leakage under the dam or around the ends. No springs developed in the canyon below the dam, and the reservoir bottom appears to be tight, the data thus far obtained indicating that substantially all losses can be accounted for by evaporation.



An inclined drop on the Umatilla project, Oregon



## CUCUMBERS PAY C. M. BAGLEY

*Sunnyside division, Yakima project, Washington*



Mr. Bagley's cucumber field

THE problem of a cash crop, one of the farmer's greatest needs, is being solved so successfully on the Sunnyside Division of the Yakima project by C. M. Bagley and his family that the two older sons were able to enter college this fall, largely as the result of their summer's work.

Two years ago Libby, McNeill & Libby began contracting acreages of cucumbers for pickling, the policy of the company being to furnish seed and contract for very small acreages, such as the farmer and his immediate family can care for properly.

Mr. Bagley contracted for 2 acres in 1924 and  $1\frac{5}{8}$  acres in 1925.

The soil was rich sandy loam, and a portion was fertilized with barnyard manure at the rate of a little more than 20 tons to the acre, the best results being obtained, however, from land on which alfalfa had been turned under.

The first year the crop was planted in rows 6 feet apart, in hills from 3 to 4 feet apart. Because of the trouble experienced with wire worms, the seed was drilled in the second year, but the former practice was found to be more successful.

The ground was thoroughly prepared by cultivation before planting and was cultivated after each irrigation (Mr. Bagley stresses the importance of cultivation), being hand cultivated twice. The field was ditched out for irrigation with a furrow on each side of the row, as close to the row as possible, and during the heavy growing season it was necessary to irrigate the crop about once a week, the amount of irrigation being that required to maintain an even moisture in the soil.

The 1925 crop was planted on May 15 and picking began on July 8, being continued every other day for 60 days, until the children started to school.

In 1924 21 tons of cucumbers were marketed, realizing \$856 from the 2 acres; and, in 1925, 26 tons were picked, realizing \$908 from the  $1\frac{5}{8}$  acres. The 1925 growing season was long and hot, which tended to increase the size of the cucumbers while decreasing their value. The largest day's picking, on August 10, amounted to 2,515 pounds. Seventy-five dollars was spent for outside help in 1924 and \$30 in 1925.

The contract prices were \$75 per ton for cucumbers 1 to 3 inches long, \$40 per ton, 3 to 4 inches, and \$15 per ton, 4 to 5 inches, with an optional price of \$10 for nubs and crooks. For the year 1925 the company shipped from its temporary station at Sunnyside, Wash., to its pickling works at Auburn, Wash., 41 cars, or about 8,000 barrels of approximately 400 pounds each.

Mr. Bagley, who is also engaged in dairying and general farming, considers his cucumbers only as an incidental, but believes that the crop assists more than any other he has found in giving profitable and fairly easy employment to his children, of whom he has several of school age. Probably the most secure and satisfactory agriculture being practiced on the Yakima project is that characterized by a diversification which includes the growing of some one or two cash crops.

## MILK RIVER PROJECT SUGAR FACTORY

AN event of far-reaching importance to the Milk River project, Montana, was the opening in the latter part of October of the new \$1,000,000 sugar factory at Chinook. The factory stands on a site just east of the city and covers 40 acres. The building proper is of brick and steel construction and is 70 feet wide and 400 feet long. It stands three stories high. There are enormous storage warehouses, 250 by 400 feet in size, for 20,000 tons of beets. The factory capacity is 120 tons of beets daily, with an output of 4,000 bags of sugar a day. Five thousand five hundred acres of sugar beets were planted in the Milk River Valley this summer. Yields reported range from 10 to 22 tons an acre.

At the opening ceremonies the opinion was expressed that the valley is capable of producing enough beets for several factories. Bishop C. W. Nibley stated that an irrigated farm of 20 acres is large enough for any family, and that an acreage of this size, intelligently farmed, will return a good living. He pointed out that dairying goes hand in hand with the establishment of the

sugar-beet industry, and asserted that what is needed more than anything else on the project is a lot of hard-working people.

Governor Erickson declared that Montana's future agricultural success depends more on the successful development of its irrigation possibilities than upon dry farming, and added that irrigation was needed for sugar beets, dairying, and intensive farming.

W. H. Wattis, general manager of the sugar company made a plea for more people in the Milk River Valley. "Your sample population is fine," he said. "Now let us see more of the same kind. You have everything here that should attract the right sort of farmers—comparatively cheap land, wonderful climate, and productive soil. It should be easy to get new settlers. You have learned during the last summer that it takes labor to raise sugar beets. You can't expect a stable supply of labor unless you have a large population."

The sugar-beet crop this year on the project is of exceptionally high quality and should bring excellent cash returns to the growers.

## AUGUST MAASS, SUCCESSFUL FARMER

*Belle Fourche project, South Dakota*



Farm home of August Maass, Belle Fourche project, S. Dak.

THE sheep industry has been a bright spot in irrigation farming during the lean years of the postwar period and has spelled success for those water users on the Belle Fourche project, South Dakota, who took up sheep farming as their principal line. The result obtained by August Maass is an example of profits to be derived from specialized livestock production that includes feeding of all grain and bulky crops on the farm.

Mr. Maass owns a 160-acre farm with 103 acres of irrigable land. This is given to the production of ordinary feed crops, including alfalfa, corn, and small grain. In 1919 he purchased 150 ewes at top prices, and under the drastic deflation which followed his profits at first were on the wrong side of the ledger. Thrift and industry surmounted all obstacles. The sheep market was the first to be reestablished and with it his flock increased to proportions that balanced his farming operations. Mr. Maass winters about 450 ewes and during the past several years had a record lamb crop of 130 to 140 per cent. This means that he markets each year about 600 fat lambs with a gross return of \$13 to \$15 per head. But this is not all. Last year he sold 4,500 pounds of wool at 46½ cents per pound, so that the total income from his band of ewes runs into five figures.

No attempt is made here to go into the intricacy of net returns and labor income. There are expenses of course, but Mr. Maass agrees that sheep farming doubles the market value of his alfalfa hay which

in recent years has been selling at \$6 to \$8 in the stack. The same is true of corn and small grain which are unprofitable irrigated crops unless shipped on the hoof. Three tons of alfalfa at the prevailing price mean a gross return of \$21 per acre, but six fat lambs per irrigated acre is another story.

Sheep raising is perfectly adapted to irrigation farming on the Belle Fourche project. The lambing season requires intensive application, but is generally over before the land is ready for spring work. From May to October the ewes and lambs are on the open range in care of a herder and the farmer's time can be given to the usual activities which are plentiful during the growing season. Fifteen cents per head per month for ewes is the usual price for summering the flock and the herder has a hundred miles of open country available for pasture.

In order to get good results, even with the contour flooding system, it is necessary to do considerable smoothing or leveling of the land.

## THE SETTLEMENT CONFERENCE

THE sessions of this conference will be held in the auditorium of the Interior Department Building, December 14 and 15. The purpose of it is to devise means for making rural life more attractive and to broaden the opportunities for settlement and farm development by people of small or moderate means and to consider Federal reclamation as applied to swamp and cut-over lands authorized by the last Congress.

Some of the conditions prompting the calling of this conference are unoccupied farms on reclamation projects, which number about 6,000; about 500,000 acres are unirrigated, uncultivated, and largely unsettled. The settlement of these lands will not only contribute to the economic and social value of the reclamation policy but will improve the financial condition of Federal projects, spreading the expense over a greater number of people and lessening the individual burden, thus creating contented farm communities.

The Secretary of the Interior will open the meeting, and immediately following his address of welcome there will be an address by the Secretary of Agriculture. The chairman of the Subcommittee on Appropriations for the Interior Department, Hon. Louis C. Cramton, Col. John H. Carroll, Dr. John A. Widtsoe, Hon. Thomas E. Campbell, and representatives of the western and southern railroads and of the colleges of agriculture and universities of these sections will speak or take part in a general discussion of our problems from their standpoint. In an evening session, Doctor Mead will give an illustrated talk on aided and directed settlement, as will also our director of reclamation economics, George C. Kreutzer. The session on December 15 will be opened by an address by Hon. E. C. Finney, First Assistant Secretary of the Interior. There will also be addresses by Senators, Congressmen, representatives from chambers of commerce, and others, all built around the theme of land settlement and farm development.

In a later number of the NEW RECLAMATION ERA we will print the complete program of the conference as finally decided on.

A beautiful thought will be carried to the conferees by the exhibit of a wall chart with the following wording:

"It is from the tillers of the soil that spring the best citizens, the staunchest soldiers; and theirs are the enduring rewards which are most grateful and least envied. Such as devote themselves to that pursuit are least of all men given to evil counsels."—(CATO, about 50 years before Christ.)

## THE COLORADO TON-LITTER CONTEST

*By H. A. Ireland, associate agriculturist, Montrose, Colo.*

**T**HE ton-litter contest for 1925 closed in Colorado on November 1. The purpose of this contest was to determine the greatest weight of pork possible to produce from one litter in 180 days and the cost of such production; also to encourage the use of better stock, saving the pigs at farrowing time, and the feeding of properly balanced rations made up as largely as possible from home-grown feeds.

In the two counties of Montrose and Delta, which comprise the Uncompahgre project, there were more than 20 entries in the contest this year, but only a few were able to finish. Several litters were entered before they were farrowed and proved to be too small to make it worth while for the owners to try for the minimum weight of 2,000 pounds in 180 days. Other litters suffered the loss of some of the pigs, others were not the right kind of stock to make the required growth, and

in other cases the feed ran out before the pigs were finished.

This proved to be a bad year in some respects for such a contest, for the price of all feeds has been exorbitant, and for some reason it seemed to be necessary for most of the contestants to buy feed. Money was hard to get and the feed wasn't bought; hence some of the litters that would very easily have qualified were not given a chance to show what they could do. In a way the fact that feed was high has proved an advantage, for it so happened that the three litters that completed were all finished on feeds that were purchased in small amounts on the retail market and in spite of this handicap all three showed a fair margin of profit over feed cost. It is interesting to note the similarity of gains and costs in the three cases, as shown in the accompanying figures:

### W. R. HARKNESS, MONTROSE

11 pigs raised, Duroc-Jersey breed; final weight at 180 days, 2,228 pounds:	
Feed—	
1,700 pounds bran.....	\$32.45
3,700 pounds corn.....	107.45
175 pounds tankage.....	7.80
720 gallons skim milk.....	21.60
1/4 acre pasture.....	2.50
Total.....	171.80
Hogs sold at 11 1/2 cents per pound brought.....	256.22
Less feed cost.....	171.80
Profit.....	84.41
Feed cost per hundredweight gain.....	7.72

### MRS. A. F. HUSER, MONTROSE

11 pigs raised, Duroc-Jersey breed; final weight at 180 days computed; actual weight at 168 days, 2,386 pounds:	
Feed—	
1,500 pounds oats.....	\$26.35
1,500 pounds bran.....	28.50
350 pounds tankage.....	17.50
900 pounds barley.....	21.60
600 pounds shorts.....	14.40
1,800 pounds corn.....	43.20
700 pounds wheat.....	17.50
472 gallons buttermilk.....	11.80
760 pounds mixed feed.....	18.90
1/4 acre pasture alfalfa.....	2.50
1/4 acre green corn.....	8.00
Total.....	210.25
Hogs sold at 11 1/2 cents pound, 2,556 pounds.....	293.94
Less feed cost.....	210.25
Profit.....	83.69
Feed cost per hundredweight gain.....	8.22

### N. D. SIMPSON, CEDAREDGE

10 pigs raised, Duroc-Jersey breed, final weight at 180 days computed; actual weight at 185 days, 2,553 pounds:	
Feed—	
2,300 pounds shorts.....	\$48.70
5,200 pounds corn.....	144.60
100 pounds tankage.....	4.50
150 gallons skim milk.....	4.50
Total.....	202.30
Hogs sold at 11 1/2 cents pound, 2,463 pounds.....	283.24
Less feed cost.....	202.30
Profit.....	80.94
Feed cost per hundredweight gain.....	8.21

## COLUMBIA RIVER WATER ALLOCATION

A meeting of the Columbia River Water Allocation Commission was held at Spokane, Wash., on October 31, at which the following members were present:

Col. W. J. Barden, United States Engineer Corps, Federal Power Commission.

Maj. R. T. Coiner, War Department.  
R. K. Tiffany, supervisor of hydraulics, State of Washington.

J. L. Lytel, superintendent of the Yakima project.

Glenn Parker, United States Geological Survey.

C. S. Heidel, State engineer of Montana, and Warren G. Swendson, commissioner of the Department of Reclamation, Idaho, members of the commission, were not present.

The matter of studying the available information relative to the waters of the Columbia River was discussed, and it was thought that the several reports that have been made on the Columbia Basin project and the water supply for it should be obtained and their contents studied.

In view of the absence of representatives from Montana and Idaho, no definite action was taken and the meeting was adjourned to meet at Seattle in December.

The ton-litter contest has been promoted by the State Agricultural College, the Denver Chamber of Commerce, local chamber of commerce, and the Denver & Rio Grande Western Railroad. Fifty dollars was contributed by the Denver Chamber of Commerce to any county that would put up an equal amount, the \$100 being divided in four prizes in the proportion of \$50, \$25, \$15, and \$10. In addition, packing companies have given special prizes of cash or feeds.

Locally interest in the contest seems to warrant its repetition and it is hoped that the cooperating parties will continue their interest in the project.

## WATER CONSERVATION AND CONTROL MEETING

Water conservation and control is the general subject of a conference at Seattle on December 8 of representatives of the 11 Western States, held under the auspices of the western division of the Chamber of Commerce of the United States.

As stated in the preliminary program, "while the water conservation and control program as outlined is primarily of an informative or educational nature, some common grounds for recommendation are sure to develop. These may deal with national or State policies, or merely with desirable local attitude or action in water conservation matters. The essential purpose is to interest and inform business in the more important matters of water conservation and control."

The program includes the following addresses:

Federal and State cooperation in the financing and settlement of western irrigation and reclamation projects, by J. L. Lytel, superintendent of the Yakima project, Washington.

How rapidly are the various States justified in pressing at this time programs of water conservation and control, and in what way should the State and National Governments assist? by Dr. John A. Widtsoe, member of the board of survey and adjustments, Bureau of Reclamation.

Financing irrigation projects through district bond issues, by W. R. Williams, formerly superintendent of banks and member of the Irrigation District Bond Commission of California.

Salt should be kept before sheep at all times. They will overeat it if supplied only at intervals.

## SETTLEMENT AND CREDIT

**R**ECENTLY a questionnaire was sent to a number of organizations interested in the establishment of a definite policy of settlement and credit on the irrigation projects.

Many of the replies stressed the thought that coupled with any workable settlement plan should be the provision of adequate credit for the prospective settler, based on long-time loans at reasonable rates of interest. Equally important is a policy under which settlers receiving such credit would recognize definitely that these obligations must be lived up to, and that otherwise the success of future reclamation would be impaired. This thought is forcefully expressed in the following comment from a representative of one of the Western agricultural colleges:

If a workable plan concerning credit with low interest is established, together with a long-time payment of the principle, it will stimulate settlement of farmers on these lands. I think, however, that the Reclamation Service has made a mistake by putting off from time to time payments that were originally to be required of the settlers. It is my opinion that in many cases these payments could have been made, but that many farmers obtaining land from the Reclamation Service and farming it for awhile have gotten the idea pretty firmly fixed in their heads

that it was not necessary to meet their obligations to the Government. The action of the service in the past would indicate that their surmise is correct. I think that the principal thing needed at this time is to formulate a workable plan; provide opportunities for a worthy farmer to finance himself during the development period; make the payments such that he can meet them; and then see to it that he fulfills his part of the obligation, or take the farm away from him and put some one else upon it.

The wishy-washy policy that has been followed will ruin any plan proposed, but as soon as these men find out that the Government means business, and that if the individual does not meet his obliga-

tions to the Government he forfeits his farm, you will find that the payments will be made.

The answers to the questionnaire also bring out clearly that selection of settlers on the basis of known qualifications is essential to the success of reclamation development.

Another suggestion meriting consideration is that enough land should be seeded to alfalfa and made ready for other crops, prior to settlement, to enable a settler at least to pay expenses the first year from his farming operations. Clearing, leveling, and running ditches can be done more economically in large units and could be included in the construction charge and repaid as a part of it; or the sums thus advanced could be secured by notes and mortgages and repaid as an interest-bearing obligation over a period of years suited to the character of the advance.

Unoccupied farms on the projects should be put into attractive shape. Buildings should be repaired and painted, fences straightened up, and fence corners cleaned out. As one correspondent expresses it, "One dilapidated farm will do more to injure a sale and discourage new settlers than anything else."

Judging from the replies to this questionnaire, the time has come when States, financial institutions, railroads, and business interests generally must get together and solve the problem of farm-land development, of which financing the settler is the outstanding question.

### BELLE FOURCHE SHOWS WHAT CAN BE DONE

*Bert Jenks, one of the prosperous farmers living 4 miles east of Nisland, states that his 12-acre field of corn averaged 85 bushels per acre.*

*With cucumbers bringing in from \$400 to \$500 per acre, sugar beets averaging around 20 tons per acre, and corn yielding from 60 to 85 bushels per acre, it is evident that the Belle Fourche project has possibilities.*



More than 37 per cent of the cropped area on the projects was devoted to alfalfa in 1924



## IS COLORADO RIVER SILT A NATURAL FERTILIZER?

**E**XPERIENCE is demonstrating both on the Yuma project and in the Imperial Valley that the long and lauded claims of the wonderful fertilizing properties of the silts of the Colorado River have been much overdone. A great many now believe the silts are an actual detriment to the lands instead of a benefit. With the real sandy lands, the first application of the silts tends to improve the physical qualities of the soil, but with further application the tendency is to make a hard soil that is very difficult to cultivate. Where the sandy contents are removed, such as is done with the desilting at Laguna dam, and under the natural process of desilting carried on through the irrigation systems, the clay materials are carried out upon the soil. This in time builds up a layer of very rough clay material. Recently a run of water showed a very high silt content, reaching a maximum at Yuma of 3.75 per cent. Many of the farmers refuse to irrigate with the water carrying such high quantities of silt. Those who did irrigate obtained a layer of silt, in some places as much as one-quarter of an inch in thickness. This silt, when containing moisture has much the constituency of rubber, thus excluding the air from the soil. Upon becoming dry it cracks and rolls. Finally this becomes mixed with the soil in the cultivated fields and part

of its detrimental effects are overcome for the time being, but with many applications of this variety of silt the soil becomes compact and hard. In the uncultivated fields like alfalfa a blanket gradually forms which is compact and hard and excludes the air to a greater or less extent.

### BOARDS APPOINTED TO SELECT SETTLERS

Additional boards for the selection of settlers under the provisions of subsection C of section 4 of the act of December 5, 1924, have been appointed by the Secretary of the Interior, as follows:

*Shoshone project.*—Frannie Division: C. M. Davis, Deaver, Wyo.; H. S. Looper, Lovell, Wyo.; and L. H. Mitchell, Powell, Wyo. Willwood and Garland Divisions: C. M. Cox, Cody, Wyo.; F. A. Mills, Powell, Wyo.; and L. H. Mitchell, Powell, Wyo.

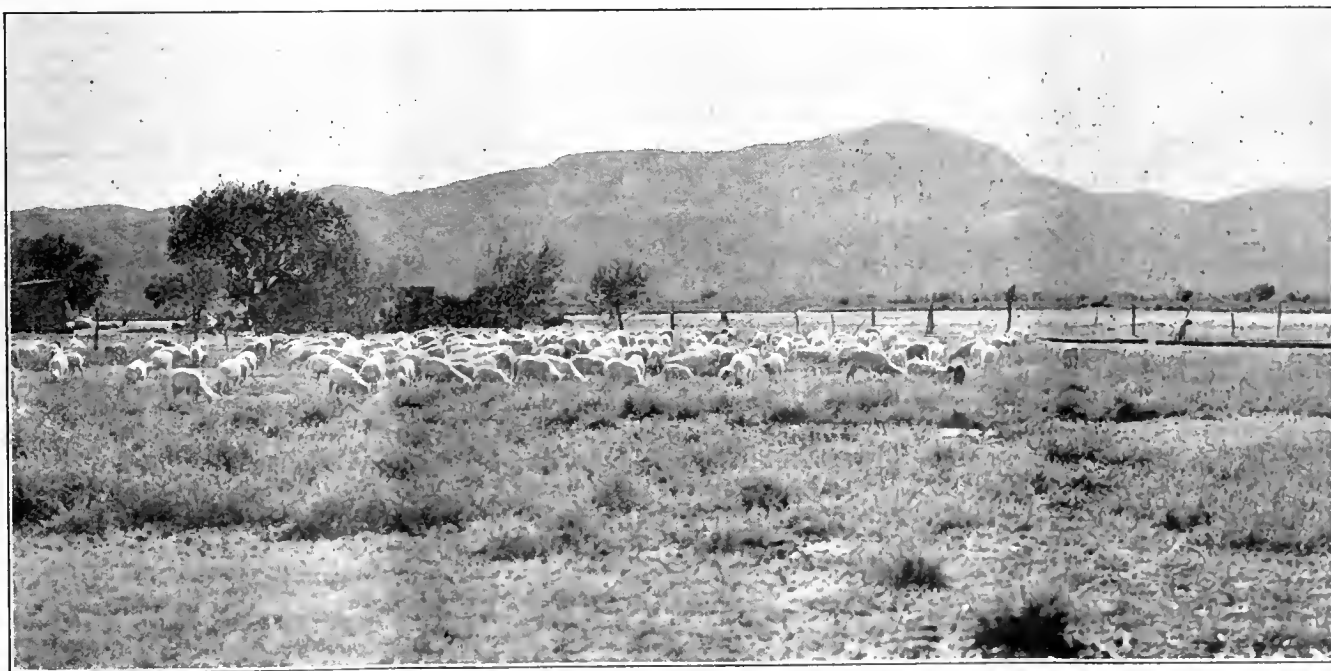
*Newlands project.*—I. H. Kent, Fallon, Nev.; J. F. Richardson, Fallon, Nev.; and C. G. Swingle, Hazen, Nev.

Membership of the boards for the Grand Valley, Uncompahgre, and Klamath projects was given in the November issue of the NEW RECLAMATION ERA.

The fertilizing qualities in the silt itself are those which are naturally in the Yuma project soils and are of little or no value. The main elements that these desert soils lack are nitrogen and phosphoric acid. The former is leached out of all of the silty material and the latter, if present, is not in a form that is available to plant life. Of course, there is some variation in the desirability or undesirability of the silts, depending upon the area from which the particular flood may have originated which brings the silt into the Colorado River.

A striking example of the detrimental effect of these silts was noticed recently on the project. One of the farmers west of Yuma irrigated his alfalfa with the muddy water and an adjoining neighbor refused to put this water upon his alfalfa. On October 4 and 5 there was a rainfall of 1.60 inches in the Yuma Valley. The alfalfa that was irrigated with the muddy water turned yellow and sickly looking, whereas across the road on the tract that was not irrigated, the alfalfa put on a wonderfully new green growth and outstripped the field that was irrigated. The irrigated field had quite a coating of silt left upon it. In the last few years these examples have been common.

The wonderful fertilizing qualities of the silts of the Colorado River have been advocated for so long that the majority of the people take it for an accepted fact without studying the matter themselves, but it will be found among the more progressive farmers and those who have taken an interest in agricultural development that they are coming to the above conclusion.



Many of the projects winter thousands of head of sheep



## SOUTH PLATTE RIVER COMPACT

**T**HE compact providing for the equitable division and distribution of the waters of the South Platte River between the States of Colorado and Nebraska, signed at Lincoln, Nebr., April 17, 1923, by the commissioners of the respective States and recently ratified by the legislatures of those States, marks the consummation of the first effort to adjust by treaty an interstate river controversy between two or more States of the arid region.

This points the way to a happy solution of a very difficult problem with which many States have been and are confronted and heralds the approach of the day when prolonged and expensive litigation will be supplanted by this more expeditious and effective method of composing disputes relating to the division of waters flowing in the interstate streams. It is safe to predict that other States will emulate the worthy example thus set.

The compact, which it is declared shall include and be binding upon the citizens, corporations, and others in each signatory State engaged or interested in the diversion and use of the waters of the South Platte River, divides the stream system into two geographical divisions designated as the upper section and lower section, and provides for the joint maintenance of an interstate gauging station to be located near Julesburg, Colo., for the purpose of ascertaining and recording the quantity of water flowing from Colorado into Nebraska as an aid to the administration of the compact.

The water is to be divided between the two States in accordance with schedules stated showing the amounts, places, means of diversion, and seasons of use by the respective States and their citizens, due regard being had to perfected rights and priorities established by court adjudications.

Nebraska grants to Colorado the right to acquire by purchase, prescription, or condemnation, rights of way necessary for the construction, maintenance, operation, and protection of irrigation works in that State necessary for the diversion, carriage, and utilization of water in Colorado. Colorado extends to Nebraska a similar privilege.

The compact specifies that it is designed to meet physical and other conditions peculiar to the South Platte River and disclaims any intention by the compact to establish any general principle or precedent with respect to other interstate streams.

It is provided that the contract may be modified or terminated at any time by mutual consent of the signatory States, with a provision that if so terminated and Nebraska or its citizens shall seek to enforce any claims founded on vested rights, the statute of limitations shall not run in favor of Colorado or its citizens with reference to certain claims enumerated.

The compact, it is provided, shall become operative only when approved by the legislature of the two signatory States and by the Congress of the United States.

## COLONIZATION IN ARGENTINA

**I**N an article entitled "The South American melting pot," in a recent issue of the Saturday Evening Post, Isaac F. Marcossan refers to the efforts of Argentina to induce immigration and colonization on a large scale. The ideal back of the colonization laws was expressed as follows by President De Alvear:

Immigration will not yield its utmost benefit in connection with the real activities of the country, nor will it improve our production, if the difficulties which at present hinder and obstruct colonization are not removed. We must give definite and permanent access to the soil to the rural worker. For the worker, whether he be tenant or partner, the feeling of actual ownership of the ground he works is the great stimulus to effort. We need more small farms. We need more small farmers. The only way to get them is to assist them to own their own land.

The greatest obstacle referred to by President De Alvear is the fact that control of the bulk of the land is in the hands of old and influential Argentine families, who have steadily opposed colonization schemes involving the small farmer.

Under the new plan, however, the law provides "for the expropriation of 50 per cent of the larger estates if the pro-

prietor himself has not already colonized one-half of his holdings or does not immediately take steps to do so. The Government is authorized to sell the expropriated land in small parcels on easy terms, and to establish or to promote credit, insurance, and cooperative institutions for the encouragement of agriculture."

The Jewish colonies in Argentina, under the direction and sponsorship of the Jewish Colonization Association, are a tribute to the philanthropic work of the late Baron de Hirsch. Colonists are obtained by the association through agencies in Moscow, Warsaw, Bucharest, Budapest, and other points. The total land ownership of the 15 established colonies now amounts to 1,355,600 acres, with 375,000 acres in reserve for future operations.

The land is sold to the colonist at cost, and the settler is advanced \$3,000 for the purchase of a house, farm implements, and the necessary farm animals. Repayment on the land and the loan is in 20 annual installments at 5 per cent interest. The property can not be sold until the debt is paid off, at which time the colonist receives title to his holding. In one colony the value of the land has increased from \$8 an acre to \$160. Each

colony has adequate schools, churches, a cooperative society, and a bank. The principal crops are wheat, linseed, oats, barley, corn, and peanuts.

Despite the evident success of these Jewish colonies and the possibilities for colonization on a large scale through the new colonization laws, it is pointed out that more recent efforts of North American colonists to obtain a foothold in South America have usually ended in disaster. Among these have been many western farmers who have been attracted by glittering prospectuses to sell out and try their luck in South America.

The usual reasons why these undertakings fail are that they are situated at too great a distance from marketing centers or railroads leading to marketing centers, unfavorable climate, doubtful title to the land, unfriendly native sentiment toward foreign agricultural settlers, and ignorance of the language and customs of the country.

Superintendent Newell and H. K. Smith, hydrographer, Klamath project, made a trip recently through the upper reaches of Willow Creek, the main feeder of Clear Lake. The object of the trip was to inspect the reservoirs which have been constructed on the watershed by the ranchers. From the evidence obtained it does not appear that the water supply of the project will be affected appreciably by such works as have been built thus far.

## ORGANIZATION ACTIVITIES AND PROJECT VISITORS

**G**LENN C. WRIGHT, senior engineer, ing draftsman in the Denver office was transferred to American Falls on October 24.

Ignacio L. Figueroa, adviser in the Lands and Irrigation Department of the Mexican Government, is making an inspection study of several of the irrigation projects, with special reference to settlement and economic problems.

Congressman Clarence F. Lea visited the Orland project during the month and directed special inquiries toward the proposed Stony Gorge Reservoir and general project conditions during the year.

The Senate Irrigation Committee arrived on the Yuma project late in October. Superintendent Preston, Fred Blohm, and W. E. Johnson, a committee of the Yuma County Water Users' Association, met the committee at El Centro. Former Chief Engineer Weymouth accompanied the party.

Col. B. F. Fly, of Yuma, official guardian of the interests of the Yuma project and particularly of Yuma Mesa, is spending the winter in Washington, D. C., and is a frequent visitor at the Washington office.

Mrs. Sadie Maddux, clerk on the Carlsbad project, has resigned, effective October 31.

J. L. Savage, designing engineer of the Denver office, recently visited the Boise project and inspected a possible reservoir site on Upper Payette Lake. L. N. McClellan, engineer, also visited the Black Canyon Dam power plant, which was about complete and ready for a trial run.

George W. Lyle, bookkeeper at the Burley office, Minidoka project, since August 8, 1922, has been transferred to the King Hill project, effective October 25, to fill the vacancy caused by the resignation of E. V. Hillius, former chief clerk.

J. L. Savage, designing engineer, and B. W. Steel, engineer, from the Denver office, visited the American Falls work recently to confer with local officials as to the work on the dam and the details of the plans.

W. H. Olin, agriculturist of the Denver & Rio Grande Western Railroad, spent several days on the Grand Valley project and was shown certain areas in which he was particularly interested from a colonization standpoint. Mr. Olin expressed himself as quite hopeful that considerable progress can be made in the settlement of the project and Orchard Mesa within the next year.

Oro McDermith, consulting engineer of the Kittitas Irrigation District, is in Washington, D. C., in connection with matters relating to the proposed development of the Kittitas division of the Yakima project.

Oliver P. Morton, formerly district counsel of the bureau and special assistant to the Attorney General in charge of the Orland water right adjudication suit, has been retained by the Orland Water Users' Association in connection with pending developments in the case.

John S. Longwell, former superintendent of the Shoshone project and now resident engineer for the East Bay Utilities District, visited the Orland project recently. Mr. Longwell is in charge of the aqueduct division of the Mokelumne project for bringing in a water supply for the East Bay cities of the San Francisco Bay region.

Andrew Weiss, assistant director of reclamation economics, was in Madras, Oreg., recently in connection with investigations of the Deschutes project.

District Counsel Roddis was a recent visitor on the Shoshone project, principally in connection with obtaining data as to the fulfillment of agreements made by water users when they secured extensions of time on repayments under the act of May 9, 1924.

The appraisal and classification of lands on the Spanish Springs project, owned by the Central Pacific Railway Co., have been completed by Engineer A. W. Walker and D. G. Christen, field agent, Land Department, Southern Pacific Co. A total area of 11,490 acres was covered.

W. G. Swendsen, land commissioner of Idaho, visited the Klamath project recently. He is interested in securing data on the possibilities of new industries on the project.

E. U. Combs, agricultural superintendent of the Sacramento Sugar Co., recently inspected the irrigable lands of the Klamath project, especially, the Tule Lake area, with a view to determining their adaptability for raising sugar beets. Mr. Combs was impressed with the quality of the beets raised for experimental purposes and expressed himself as being confident that the Klamath district would develop into an important sugar-beet area.

### WOMEN'S PLACE IN RECLAMATION GROWTH

*Economists are unanimous in stressing the important place occupied by women in rural life. The value of their work in making homes out of mere dwelling places, in ameliorating the hardships incident to the transformation of the desert into a farm community, and, in general, in coordinating all those activities which tend to contentment under adverse conditions and the building up of the highest type of rural life, can not be overestimated. The reclamation projects offer exceptional opportunities for organized effort on the part of the women. On many of the projects the work they have done and are doing leaves little to be desired.*

*With a view to bringing the activities of the women on these projects to the attention of others where there is need for greater development, the NEW RECLAMATION ERA is planning to print from time to time special articles in the interest of project women. Miss Mae A. Schnurr, secretary to the commissioner, has been designated associate editor of the ERA to further this cause, and will be glad to receive suggestions from the project women individually or through their women's organizations.*

*In any event, you are urged to write evidencing your interest in adding this feature to your magazine. These letters will act as a stimulus and inspire and urge the writer to greater effort in bringing to the women on the farms reading matter we hope they will look forward to receiving.*

## FARMERS: INVENTORY AND APPRAISE ALL YOUR LIVESTOCK! I.

OUR sons and daughters in these days are viewing more and more critically the conditions of farm life and require, probably more than ever before, to be convinced, against the thoughtless evidence of their eyes, that real independence, a full measure of self-respect, and the best opportunity to develop family life, are still, and always must be, offered on the farm.

It becomes, therefore, our best interest to retain a grip upon their confidence and their sympathy in order to exert that influence for the family good which our affection and experience should contribute.

Our boys are our best, our most precious livestock! Accordingly, their appraisal should be measured by their work, whether well-willed and susceptible to training, by the part they play in the family life, and the incentive they contribute to their sire to his improving and maintaining the farm free from debt and to so hand it down to their generation.

In how many cases do farmers fail in the often delicate matter of their relation to their sons because of failure to develop their value to the farm? Far too often, I think!

Every boy is born under some constellation. If under Boötes, the Plowman, then a farmer is in the making. But to realize his destiny youth must be on the lead rope, for teaching and training, lest undirected ambition or standards too high for individual health and strength come to discouragement, or lack of sympathy and attention permit the active thought of youth to wander elsewhere.

It is the natural inclination of healthy boys exercising freedom of choice to choose the best of their associates for their friends, read the best books, prefer good movies, and subscribe to a good newspaper. In casting up the account of profit and loss later in life choice will appear to have exerted a great influence, not only through education but in every channel of activity.

Results, then, arise from choice, and luck, so often credited with the influence to which it is not entitled, is only "being prepared to take advantage of opportunity."

In the old days the driving colt required a bit suitable to his temper and his mouth, and so must the bit of parental guidance be chosen to suit the individual boy.

If he shows reluctance to be led and a repugnance to farm life, the boy's fitness probably lies in another direction. If patient observation reveals such a fixed inclination to desert the farm, the father's expectation of a son on the farm must give way, and should give way gracefully, to another career.

Farmers who can use labor only part of the year are likely to be hardest pressed for help when they need it and to get only a poor class of labor.

Many farmers could, at reasonable expense, provide new or alter existing structures to afford more acceptable quarters for casual farm laborers.

## APPLE GROWERS' PROSPECTS BRIGHT

The per capita consumption of apples in the United States is now about half an apple a day.

The total crop this year will amount to about 164,000,000 bushels, compared with 179,000,000 bushels last year. The present year's crop is of unusually fine quality, and less than the ordinary proportion of the crop will be wasted or used for manufacturing purposes. The commercial crop will reach 30,134,000 barrels compared with 28,587,000 barrels last year.

## AGRICULTURAL PRICES AND COSTS

The accompanying chart, showing relative agricultural prices and costs from 1914 to 1924, inclusive, with 100 as the base in 1914, was prepared by the National Industrial Conference Board (Inc.), of New York City.

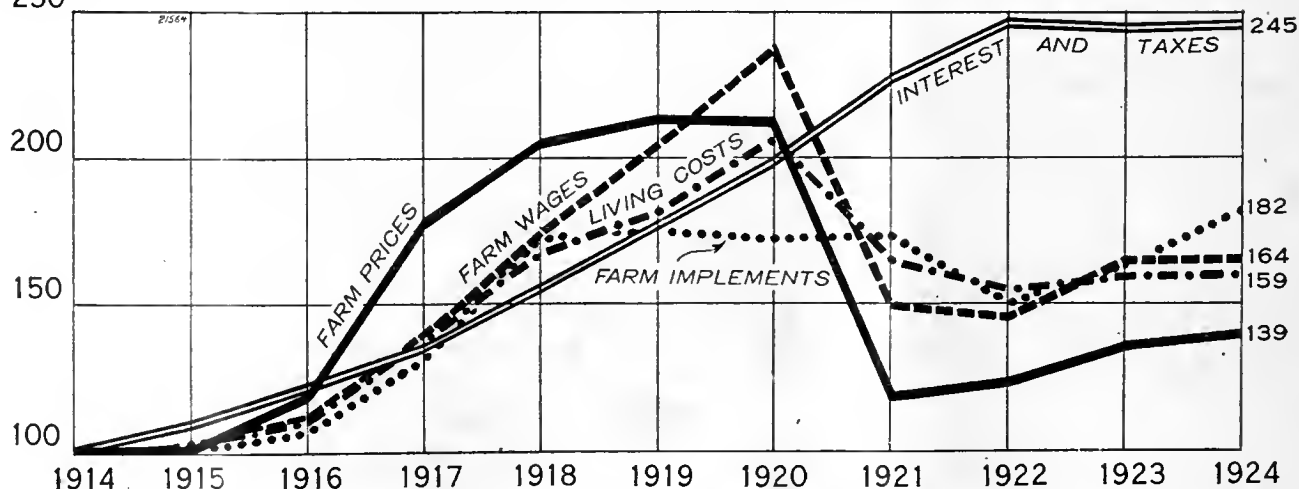
"Farm implements" represent dealers' prices in April for 10 standard farm implements. "Farm wages" is an index of wage rates per month, per day, with and without board, weighted according to the prevalence of each type of payment. "Living costs" represent the retail cost of living, omitting rent. "Farm prices" are prices paid to farmers for 30 representative farm products weighted in proportion to the relative amounts marketed in the period 1918-1923.

For flooding over the top of the ground, larger heads of water can be used than in the case of corrugation systems.

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THE GROSS RETURNS IN 1925 FROM THE COTTON CROP ON THE RIO GRANDE PROJECT ALONE WERE MORE THAN \$8,500,000, AN INCREASE OF MORE THAN \$1,500,000 OVER 1924

## —RECLAMATION

*THE NATIONAL GOVERNMENT is committed to a policy of reclamation and irrigation which it desires to establish on a sound basis and continue in the interest of the localities concerned. Exhaustive studies have recently been made of Federal reclamation, which have resulted in improving the projects and adjusting many difficulties. About one-third of the projects is in good financial condition, another third can probably be made profitable, while the other third is under unfavorable conditions. The Congress has already provided for a survey which will soon be embodied in a report. That ought to suggest a method of relief which will make unnecessary further appeals to the Congress. Unless this can be done, Federal reclamation will be considerably retarded. With the greatly increased cost of construction and operation, it has become necessary to plan in advance, by community organization and selective agriculture, methods sufficient to repay these increasing outlays.*

*The human and economic interests of the farmer citizens suggest that the States should be required to exert some effort and assume some responsibility, especially in the intimate, detailed and difficult work of securing settlers and developing farms which directly profit them, but only indirectly and remotely can reimburse the Nation. It is believed that the Federal Government should continue to be the agency for planning and constructing the great undertakings needed to regulate and bring into use the rivers of the West, many of which are interstate in character, but the detailed work of creating agricultural communities and a rural civilization on the land made ready for reclamation ought to be either transferred to the State in its entirety or made a cooperative effort of the State and Federal Government.*

—From the President's Message to Congress

December 8, 1925.

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

JANUARY, 1926

No. 1

## HIGH LIGHTS IN A REVIEW OF THE MONTH

**M**ONTROSE County, Colo., which includes the Uncompahgre project, entered 27 show samples in the pure seed show at Colorado Springs recently, and won 20 premiums, including one sweepstakes. The entries came very near winning two other sweepstakes.

**T**HE Boise project reports that inquiries for farm lands are becoming more evident. On the Minidoka project better economic conditions are reflected in new buildings, fences, and other farm improvements. The sale of automobiles is increasing.

**A**BOUT 10,000 head of sheep and lambs are being wintered on the Grand Valley project. Range cattle are being fed under contracts for furnishing forage and pasture. This type of contract is of particular advantage to the farmers, not only through the sale of their products, but also by increasing the fertility of the soil. Many farmers are beginning to realize the necessity of feeding their hay and grain instead of selling their crops for cash.

**T**he sheep-feeding industry has assumed large proportions on the Uncompahgre project, and it is estimated that about 40,000 head are being fed in the valley.

**T**HE demand for dairy cows on the Boise project is active. With butterfat at 57 cents a pound and hay at \$7 a ton, many farmers are making efforts to buy dairy cows and feed out some of their hay.

**A** carload of turkeys was shipped from Burley, Minidoka project, in November, containing 1,564 birds, for which the growers received \$6,581. Two cars from Rupert, containing 4,400 turkeys, brought \$14,000. About 120,000 range sheep and 20,000 feeder lambs are on the project.

**C**ATTLE and sheep feeding on the North Platte project is increasing steadily, and it is estimated that 10,000 head of cattle and 100,000 sheep will be fattened on the project during the winter.

**U**P to the end of November 2,260,000 cubic yards of embankment material had been placed in McKay dam, Umatilla project, at a unit cost of 44 cents, compared with the estimated cost of 50 cents.

### SOME SPUD STORIES

*Southern Idaho has been in the throcs of marketing what is claimed to be a \$24,500,000 crop of potatoes. Boise and Minidoka projects had their share, as is indicated by the following statements from the Idaho Statesman:*

*Colles Brothers, Minidoka project, sold 5,000 sacks of potatoes from their ranch for \$12,000. Two thousand sacks grown by Frank Moench netted \$5,500.*

*Albert Lee, Boise project, raised 35 acres of potatoes. On 25 acres he raised the early variety, which averaged 100 sacks per acre. On the other 10 acres of Gems he averaged 125 sacks per acre. Mr. Lee refuses to divulge what he received for his 3,750 sacks of potatoes. However, the return at \$2 per sack would be \$7,500 for 35 acres.*

*John D. Remsberg, Minidoka project, grew 8,400 sacks of potatoes on 35 acres. He sold 8,000 sacks for \$3 a sack f. o. b., Rupert, netting him \$24,000.*

*L. A. Newcomb, Boise project, has stored 11,000 bushels of potatoes, the product of his own 27 acres and some he purchased from neighbors. These are all early varieties. Figure the profit yourself.*

**T**HE Powell Creamery, Shoshone project, purchased 7,400 pounds of butterfat in November and manufactured 9,300 pounds of butter and 75 gallons of ice cream. Other purchasing agencies bought 4,400 pounds of butterfat. The Frannie division shipped 3,700 pounds of cream.

**T**HE Amalgamated Sugar Co. on November 15 issued checks in the amount of \$345,340 for beets delivered to the Paul factory, Minidoka project, in October. The Burley factory is not operating this year, and about \$165,000 of the above sum went to South Side growers.

**A**BOUT six carloads of honey have been produced this season on the Minidoka project. The Mini-Cassia Honey Growers Association handles the marketing of most of this product and is holding a large part of it in the expectation of better prices.

**A**PPROVAL has been given to the recommendation of the Commissioner of Reclamation that the Chief Engineer be authorized to notify the Utah Construction Co. in connection with the building of the American Falls dam, Minidoka project, that although the department is in favor of a high dam it could not be contracted for until Congress has authorized it; nevertheless, the contractor, if he so elects, may proceed with the high dam subject to later approval by Congress.

**C**OMMISSIONER MEAD has approved and the irrigation district officials of the Lower Yellowstone project have authorized the expenditure of \$7,500 to design and lay out a drainage system for the entire project to be paid for as operation and maintenance.



## CONFERENCE ON RECLAMATION AND LAND SETTLEMENT

*Gathering of representatives of many organizations interested in the problems of land settlement fill two-day session with constructive addresses and discussion of relation of reclamation and settlement*

AS this issue of the NEW RECLAMATION ERA goes to press the Conference on Reclamation and Land Settlement, called by Commissioner Elwood Mead and held in the spacious auditorium of the Interior Department, has just closed a two-day session, replete with beneficent possibilities for the future. It is perhaps too close to the conference to appraise at their true value the helpful results which are expected to flow from this gathering of men and women, called together from every section of the country and representing a large number of organizations, with the common tie of interest in the solution of the problems of land settlement in reclamation. It would, of course, be too much to expect complete unanimity of thought on the topics under discussion. Diverse opinions were expressed in the speeches and in the discussions which followed, yet at the close of the conference it was markedly apparent that the delegates were seeing the problems from a more nearly common point of view, that their thoughts were flowing in a more nearly common channel.

There was virtually unanimous acquiescence by the conference in the policy of the Secretary and Commissioner that the undertaking of new projects must depend upon feasibility based upon an exhaustive preliminary survey of economic factors.

Considerable discussion revolved around the question whether the surplusage in food production, to which attention was called by Secretary Jardine, should automatically put a stop to further reclamation development at the present time, the consensus of opinion apparently being that the relatively small annual increase in the productive area under reclamation projects which would be possible in accordance with the normal growth of the work would and could have little appreciable effect on the agricultural economies of the country as a whole. It was pointed out by Governor Campbell, a member of the board of survey and adjustments, that the gross value of the crops grown on the irrigation projects under the Bureau of Reclamation represented only about 1 per cent of the gross value of the crops grown in the United States as a whole; that these crops are as a rule consumed locally, are needed to meet the food requirements of a developing country, and do not come into competition with crops grown in other sections of the country.

Selection of settlers on the basis of approved qualifications met with the unanimous indorsement of the delegates,

as did also their financial aid and direction during the early years of changing the raw land into producing farms. Diverse opinions were expressed as to whether this aid should come from the Federal Government or from the States, but that some aid from some source was necessary seemed obvious to all.

The possibility that a portion of the reclamation fund might be diverted from use in the Western States, from whose resources it is largely created, to the reclamation of swamp, cut-over, and abandoned land in other sections of the country roused a number of the Western delegates to oratorical heights in defense of their position that the money should be spent in the development of that part of the country from which the fund had sprung, but in the closing hour of the session Hugh MacRae, the distinguished colonizer from Wilmington, N. C., poured oil on the troubled waters by asserting that in his opinion the West should receive more money than it had been getting for this great work of developing its arid lands.

A feature of the conference was the reading by Doctor Mead, at the opening session of the conference, of that portion of the President's recent message to Congress relating to reclamation, which is reprinted on the inside cover page of this issue. Another interesting and what was referred to by the speaker as possibly an exotic feature of the conference was an address by Dr. Emanuel Neuman, secretary of the Palestine Foundation Fund, on the work done by the Jews in reclaiming Palestine. Informative and constructive addresses were made by Representative Louis C. Cramton, chairman of the Subcommittee on Appropriations for the Interior Department, whose broad, first-hand knowledge of reclamation by irrigation was reflected in his masterly analysis of the present situation; by Representative Addison T. Smith, of Idaho, whose scholarly defense of reclamation will long be remembered by the conference; and by Representatives E. O. Leatherwood, of Utah, Scott Leavitt, of Montana, Charles E. Winter, of Wyoming, C. B. Hudspeth, of Texas, and Senator John B. Kendrick, of Wyoming, each of whom discussed some phase of reclamation and its relation to the development of the West and the Nation with the skill of long and intimate acquaintance.

The conference was opened promptly at 10 o'clock on the morning of December 14 by Commissioner Mead. Secretary

Work then welcomed the delegates and outlined the present situation from a national standpoint, his keynote being that the two real questions vital to the supremacy of this Nation are the conservation of our natural resources and the reclaiming of land lost to agriculture. His address appears in full in the supplement to this issue.

Hon. William M. Jardine, Secretary of Agriculture, followed with a short address in which he stressed the view that extensive reclamation at the present time is inopportune because of the surplusage in agricultural production, but pointed out that now is the time for an exhaustive survey of what may be needed in the future, so that a coordinated plan of agricultural development may result.

The stirring address of Representative Cramton, which appears in the supplement to this issue, followed. A few of the high points in Mr. Cramton's address which may be mentioned were that reclamation will succeed as a business proposition, in which connection he paid a high tribute to the constructive program of the Secretary and Doctor Mead; that there would be no question of success if the time spent by the water users in urging extensions of time in making repayments were spent on farming; that land must be made available to new settlers at reasonable prices; that there is need for some financing of settlers and some source of credit at a low rate of interest; and that inasmuch as a large part of the agricultural success of their future is tied up in the reclamation projects, the States should assume some of the responsibility of settlement and development.

Senator Kendrick stressed the point that the men who can pay their construction and operation and maintenance charges should meet their obligations to the Government, and that some of the elements of successful reclamation could be found in selection of settlers, community effort, financial aid and direction, preparation of the land by the Federal Government, and that the States should give moral and incidental aid in settling the projects.

The afternoon session was devoted to exceedingly interesting addresses by Dr. W. W. Long, of Clemson College of Agriculture, South Carolina, on the need of community organization; by John H. Guill, of the Federal Farm Loan Board, on credit needed in settlement and farm development; by Dr. A. M. Soule, president of the Georgia College of Agriculture,

on the economic importance of reclaiming the overflowed lands of Georgia; and by Prof. David Weeks, of the California College of Agriculture, on a land settlement policy, who suggested that a plan patterned after the California State land settlement act might be undertaken on a small scale as a demonstration by the Government.

Following the addresses came a general discussion, participated in largely by the representatives of the railroads, who indorsed the action already taken by the Secretary and Doctor Mead. The broad character of their viewpoint was reflected in the plea of John L. Cobbs, jr., of the Atlantic Coast Line, for an inventory of our national resources. Val Kuska, of the Chicago, Burlington & Quincy Railroad, spoke of the need of a definite policy in reclamation; E. F. Benson, of the Northern Pacific, stressed the need of aided and directed settlement; R. A. Smith, of the Union Pacific Railroad, questioned the desirability of opening up new projects at the present time; W. H. Olin, of the Denver & Rio Grande Western Railroad, discussed the question of what can be done with reference to the settlement of the older projects; and J. F. Jackson, of the Central of Georgia Railway, told of the possibilities of land settlement in the area served by his line provided suitable opportunities are made available for prospective settlers.

The evening session of the 14th, which was called to order at 7.30, opened with an address by Doctor Mead, illustrated

by motion pictures and colored lantern slides, in which he contrasted the results of unplanned settlement on some of the more backward projects with what has been accomplished in other countries which have adopted a policy of aid to and direction of settlers. Doctor Mead's address is printed in full in the supplement.

Dr. John A. Widtsoe, chairman of the northern division of the board of survey and adjustments, then addressed the conference on the subject of smoothing the path of colonization, drawing his inspiration from the accomplishments of the early Mormon settlers in irrigation development and pointing out that from them we might obtain the guiding principles for future reclamation. These principles he enumerated as the selection of projects containing inherent qualities which will allow industrious, intelligent farmers to succeed; selection of settlers; community organization; the need of technical and financial help for settlers; and a spiritual appreciation of the fact that agriculture is not a business which must pay 6 or 10 per cent to be successful, but a mode of living.

The evening session was concluded by an address by Hugh MacRae, of Wilmington, N. C., on the land settlement problem of the South, in which he pointed out that perhaps the two greatest needs to permit of progress are a usable system for extending necessary credit to the farmer on a small acreage—a system created from the human viewpoint rather than

from that of accepted financial usage; and a supply of skilled farm families who will act as leaders and demonstrators.

The session of December 15 opened at 10 o'clock with a scholarly address by Hon. E. C. Finney, First Assistant Secretary of the Interior, who stressed the points that the settlers must be educated to meet their debts when due, that contracts are made to be kept, and that selection of settlers is fundamental to a successful policy.

Following Mr. Finney's address came the interesting addresses, already mentioned, by Doctor Neuman and Representative Addison T. Smith. George C. Kreutzer, director of reclamation economics, then spoke on the problems of settlement of abandoned and unoccupied lands on existing Federal irrigation projects, pointing out the value of group settlements as demonstration areas. The final address of the morning session was made by Hon. T. E. Campbell, chairman of the southern division of the board of survey and adjustments, who clarified the divergent views of the conference with reflections based on long experience and intimate contact with the problems under discussion.

Doctor Mead then called on Prof. E. B. House, of the Colorado College of Agriculture, who responded with a brief talk whose central motif was the spirit of optimism. The next speaker, Frank C. Emerson, State engineer of Wyoming, deplored the misleading articles which

(Continued on page 4)



A group of delegates attending the Conference on Reclamation and Land Settlement

## DELEGATES REPRESENT ALL SECTIONS OF COUNTRY

*The list of delegates printed below indicates the widespread interest in the fundamental factors which spell success or failure in reclamation and land settlement*

(Continued from page 3)

have appeared recently in eastern magazines decrying reclamation, asserted that this is the time for abundant optimism, and expressed the belief that reclamation development should not be stopped.

The afternoon session was presided over by Howard Elliott, the distinguished chairman of the Northern Pacific Railway. The first address of this session was given by Representative E. O. Leatherwood, of Utah, who stated that reclamation has amply justified itself, made a plea for constructive reclamation legislation, and asserted that the States must cooperate on settlement problems with the Federal Government.

Representative Scott Leavitt, of Montana, spoke on the subject of making established reclamation projects a success, pointing out that it is our duty to figure out what is wrong and then to take proper action.

Representative Charles E. Winter, of Wyoming, gave the legal history of the public lands. He stated that the reclamation policy of development of new projects should not be retarded, and that every settler who can pay should be forced to pay his charges when due. Mr. Winter indorsed Federal aided and directed settlement, but asserted that State aid was impracticable and that insistence on this policy would result in retarding reclamation several years.

Representative C. B. Hudspeth, of Texas, spoke on the time and expense of developing projects and gave an interesting account of the value of reclamation in the Rio Grande Valley, stressing the 100 per cent annual repayments on the project following a request for deferments which he refused to indorse. He believed that no new projects should be begun until it was shown conclusively that every cent of their cost would be returned.

The final speaker of the afternoon was Rhea Luper, State engineer of Oregon, who spoke on the subject of Oregon's reclamation problems, and pointed out that when projects are selected on the basis of merit there are not so many failures among settlers.

The conference adjourned with the statement by Doctor Mead that its purpose was personal contact, with an exchange of views and experience, and that purposely no provision had been made for the presentation of resolutions or reports.

In the supplement to this issue will found the nontechnical addresses delivered at the conference. Digests of other addresses are included in this issue or will appear in later issues.

A list of the delegates to the conference follows:

### LIST OF DELEGATES ATTENDING THE CONFERENCE ON RECLAMATION AND LAND SETTLEMENT—DECEMBER 14 AND 15, 1925

Amory, Copley, expert in reclamation economics, Bureau of Reclamation, Washington, D. C.  
Amory, Mrs. Copley, 1811 Q Street, NW., Washington, D. C.  
Arentz, Hon. Samuel S., Nevada, House of Representatives, Washington, D. C.  
Bailey, F. J., Bureau of the Budget, Treasury Department, Washington, D. C.  
Baker, Charles H., Chicago, Burlington & Quincy Railroad, Transportation Building, Washington, D. C.  
Bebb, E. C., Federal Power Commission, Washington, D. C.  
Benson, E. F., Northern Pacific Railroad, Seattle, Wash.  
Benson, Mrs. E. F., Tacoma, Wash.  
Bonnell, George, Chicago & North Western Railroad, Chicago, Ill.  
Brewer, E. E., Chicago, Milwaukee & St. Paul Railroad, 796 Union Street, Chicago, Ill.  
Brookings, W. Du B., natural resources department, United States Chamber of Commerce, Washington, D. C.  
Brown, Hugh A., chief, division of settlement and economic operations, Bureau of Reclamation, Washington, D. C.  
Brown, Raymond K., Secretary of State, island of Hawaii.  
Browning, James L., South Carolina legislative committee, Columbia, S. C.  
Burke, Charles H., Commissioner of Indian Affairs, Department of the Interior, Washington, D. C.  
Burlaw, E. K., administrative assistant to the Secretary of Interior, Washington, D. C.  
Campbell, Hon. Thomas E., chairman, southern board of survey and adjustments, Bureau of Reclamation, Washington, D. C.  
Cardwell, G. A., Atlantic Coast Line, Wilmington, N. C.  
Cobbs, John L., Jr., Atlantic Coast Line, Wilmington, N. C.  
Coolay, A. C., agriculturist in charge of office of demonstrations on reclamation projects, Department of Agriculture, Washington, D. C.  
Cramton, Hon. Louis C., Michigan, House of Representatives, Washington, D. C.  
Crawley, K. T., Chesapeake & Ohio Railroad, Richmond, Va.  
Dent, Porter W., assistant to the commissioner, Bureau of Reclamation, Washington, D. C.  
Dern, Hon. George H., Governor of Utah, Salt Lake City, Utah.  
Donald, Wm. J., secretary to Secretary Work, Department of the Interior, Washington, D. C.  
Drummond, W. I., American Farm Congress, Kansas City, Mo.  
Elliott, Howard, Northern Pacific Railroad, New York City.  
Emerson, Frank C., Wyoming State engineer, Cheyenne, Wyo.

Farrell, George E., United States Department of Agriculture.

Finney, E. C., First Assistant Secretary of the Interior, Washington, D. C.

Fitch, T. J., Inspector, Department of the Interior, Washington, D. C.

Fly, Col. B. F., representing Yuma Mesa, Yuma, Ariz.  
Follard, Edward T., Washington Post, Washington, D. C.

Fondren, H. C., Southern Pacific Railroad, Majestic Hotel Building, Lake Charles, La.

Fox, E. B., Bureau of the Budget, Treasury Department, Washington, D. C.

French, Hon. Burton L., Idaho, House of Representatives, Washington, D. C.

Gartland, J. F., chief inspector, Department of the Interior, Washington, D. C.

Golilart, S. R., Jr., Secretary of United States Employees' Compensation Commission, Washington, D. C.

Gooding, Hon. Frank R., Idaho, United States Senate, Washington, D. C.

Goodwin, Hon. F. E., member, board of survey and adjustments, Mills Building, Washington, D. C.

Greenfield, C. I., Great Northern Railroad.

Greer, F. W., Imperial irrigation district, El Centro, Calif.

Grunwald, Kurt, consulting agricultural engineer, American Farm Congress, Medford, Long Island, N. Y.

Guill, John H., Federal Farm Loan Bureau, Treasury Department, Washington, D. C.

Hancock, E. T., Bucharest, Rumania.

Hart, R. B., Caruthersville, Mo.

Havell, F., Assistant Commissioner, General Land Office, Department of the Interior, Washington, D. C.

Haw, J. W., Northern Pacific Railway, St. Paul, Minn.

Hayden, Hon. Carl, Arizona, House of Representatives, Washington, D. C.

Henderson, Miss B., Department of Agriculture.

Hill, John Wesley, Lincoln Memorial University, Cumberland Gap, Tenn.

Hodges, LeRoy, Virginia State chamber of commerce, Richmond, Va.

Holroyd, H. B., Louisville & Nashville Railroad, Louisville, Ky.

House, Prof. E. B., Colorado College of Agriculture.

Hudspeth, Hon. C. B., Texas, House of Representatives, Washington, D. C.

Jackson, J. F., Central of Georgia Railway, Savannah, Ga.

Jardine, Hon. William M., Secretary of Agriculture, Washington, D. C.

Jones, Randall L.

Kelly, R. E., Southern Pacific Railroad, San Francisco, Calif.

Kendrick, Hon. John B., Wyoming, United States Senate, Washington, D. C.

King, Garnett, Southern Pacific Railroad, 65 Market Street, San Francisco, Calif.

Krentzer, George O., director of reclamation economics, Bureau of Reclamation, Wilda Building, Denver, Colo.

Kubach, W. F., chief accountant, Bureau of Reclamation, Washington, D. C.

Kuska, Val, Chicago, Burlington & Quincy Railroad, Chicago, Ill.

Lamson, J. B., Chicago, Burlington & Quincy Railroad, 547 West Jackson Boulevard, Chicago, Ill.

Lawson, L. M., superintendent, Rio Grande project, Bureau of Reclamation, El Paso, Tex.

Leatherwood, Hon. E. O., Utah, House of Representatives, Washington, D. C.

Leavitt, Hon. Scott, Montana, House of Representatives, Washington, D. C.

Leedy, E. C., Great Northern Railway, St. Paul, Minn.  
 Long, Dr. W. W., Clemson College of Agriculture, Clemson College, S. C.  
 Luper, Rhea, Oregon State engineer, Salem, Oreg.  
 McBride, J. M., Seaboard Air Line, Savannah, Ga.  
 McCrory, S. H., division of agricultural engineering, Bureau of Public Roads, United States Department of Agriculture.  
 McDermith, Oro, Kittitas reclamation district, Ellensburg, Wash.  
 McEwen, J. E., Genesee, N. Y.  
 McKee, Paul B., California-Oregon Power Co., Medford, Oreg.  
 McMurtry, J. P., Prescott, Ariz.  
 McNeely, J. H., assistant to the Secretary, Department of the Interior, Washington, D. C.  
 MacRae, Hugh, banker, Wilmington, N. C.  
 Mather, Stephen T., director, National Park Service, Department of the Interior, Washington, D. C.  
 Mead, Elwood, Commissioner, Bureau of Reclamation, Washington, D. C.  
 Merrill, O. C., executive secretary, Federal Power Commission, Washington, D. C.  
 Morgan, O. S., Columbia University.  
 Neumann, Emanuel, national director, United Palestine Appeal, 114 Fifth Avenue, New York City.  
 Oddie, Hon. Tasker L., Nevada, United States Senate, Washington, D. C.  
 Olin, W. H., Denver & Rio Grande Western Railroad, 237 Equitable Building, Denver, Colo.  
 Oliphant, A. C., unofficial representative, American Engineering Council.  
 Pound, Earl C., Brawley, Calif.  
 Price, W. E., Southern Railway, Washington, D. C.

Reed, W. M., chief engineer, Indian irrigation service, Department of the Interior, Washington, D. C.  
 Robertson, Miss Alice M., Muskogee Daily News, Muskogee, Okla., Cairo Hotel, Washington, D. C.  
 Rogers, C. M., Daytona, Fla.  
 Schmitt, F. E., Engineering News-Record, McGraw-Hill Co. (Inc.), Tenth Avenue at Thirty-sixth Street, New York City.  
 Schnurr, Miss Mae A., secretary to Commissioner of Reclamation, Washington, D. C.  
 Scofield, C. S., Department of Agriculture.  
 Seitz, Prof. C. E., Virginia Agricultural and Mechanical College, Virginia Polytechnic Institute, Blacksburg, Va.  
 Shelby, Mrs. Gertrude Mathews, 1 West Sixty-seventh Street, New York City.  
 Smith, Hon. Addison T., Idaho, House of Representatives, Washington, D. C.  
 Smith, George O., agricultural service, United States Chamber of Commerce, Washington, D. C.  
 Smith, R. A., Union Pacific Railroad, 1416 Dodge Street, Omaha, Nebr.  
 Smoak, W. W., Walterboro, S. C.  
 Soelberg, Earl J., livestock interests, Idaho Falls, Idaho.  
 Soule, A. M., president Georgia College of Agriculture, Mechanic Apartments, Athens, Ga.  
 Spry, Governor William, Commissioner of the General Land Office, Department of the Interior, Washington, D. C.  
 Stafford, C. B., chamber of commerce, Casper, Wyo.  
 Summers, Hon. John W., Washington, House of Representatives, Washington, D. C.  
 Taylor, Hon. Edward T., Colorado, House of Representatives, Washington, D. C.

Teele, R. P., Bureau of Agricultural Economics, Department of Agriculture.  
 Thomas, C. R., secretary, National Drainage Congress.  
 Tigert, J. J., Commissioner of Education, Department of the Interior, Washington, D. C.  
 Tredway, F., Southern Pacific Railroad.  
 Walker, Governor Clifford, Atlanta, Ga.  
 Wallace, W. R., Salt Lake City, Utah.  
 Walter, R. F., chief engineer, Bureau of Reclamation, Wilda Building, Denver, Colo.  
 Warburton, C. W., Department of Agriculture.  
 Weeks, Prof. David, University of California, Berkeley, Calif.  
 Westervelt, E. M., Chicago, Burlington & Quincy Railroad, Lincoln, Nebr.  
 Widtsoe, Dr. John A., chairman, northern board of survey and adjustments, Bureau of Reclamation, Washington, D. C.; also Utah Agricultural College, Salt Lake City, Utah.  
 Willard, E. V., State commissioner of drainage and waters, Old Capitol Building, St. Paul, Minn.  
 Wilson, M. L., Montana State College, Bozeman, Mont.  
 Winslow, F., United States Chamber of Commerce, Washington, D. C.  
 Winter, Hon. Charles E., Wyoming, House of Representatives, Washington, D. C.  
 Winter, Mrs. Charles E., 1671 Madison Street, Washington, D. C.  
 Wooton, Paul, McGraw-Hill Engineering Publications.  
 Work, Hon. Hubert, Secretary of the Interior, Washington, D. C.

## ESSENTIAL FEATURES OF A LAND-SETTLEMENT PLAN

By Prof. David Weeks, College of Agriculture, University of California

(The following is a brief digest of an address delivered by Professor Weeks before the Conference on Reclamation and Land Settlement, December 14, 1925.)

THE following may be enumerated as the essential features of a land-settlement plan:

1. To be successful a land-settlement plan must be a part of a reclamation policy which recognizes the need of completing a job once it is started.
2. Only settlers who are qualified by experience, desire to farm, and who have some capital should be allowed to purchase land on reclamation projects.
3. Farm surroundings must be made attractive if desirable settlers are to be expected to undertake the development of these farms.
4. Stipulations must be made with large landowners in advance of launching the settlement program in any locality whereby the price of land will be held at levels which will make economic development possible.
5. Land should be classified according to its productive power and according to its adaptation.
6. Careful consideration must be given to types of agriculture and to the farm program.

7. A plan of financing agricultural development is essential to any plan of land settlement.

8. Any plan for the financing of agricultural development must consider well-established principles of safe investment which have developed through years of experience by our credit institutions. It is necessary to supply credit on more liberal terms than custom has decreed safe and at the same time institute measures which will provide that security which is lacking in the settler's equity in his new irrigated farm. Under conditions of small equity the only means of providing the same security which prevails in the ordinary mortgage loan is a contract for planned agricultural development capable of being rigidly enforced between the colonizing agency and the settler.

9. Individual advice and direction of farmers unacquainted with problems of agricultural development and general farming practices in an irrigated region are not only desirable but essential.

10. More recognition must be given in the future to fluctuations in business conditions and prices of products bought and sold by the farmer.

11. Any plan of land settlement must recognize the democratic spirit which prevails among the farmers of this country and the institution of local self-government which has become universal throughout the Nation.

12. It will probably be necessary for the Government to take an active part in the agricultural development of the projects created with Federal funds.

Professor Weeks discussed the California land-settlement plan, the important features of which provide for administration by a land-settlement board, purchase by the State of raw land in a body of suitable size for colonization, selection of settlers, small first land payment by the settler, soil mapping, planning subdivision on the basis of soil analysis and topographic features, loans for improvements, loans for purchase of livestock and equipment, low rate of interest, opportunity for recreation and social activities, facilities for cooperation, agricultural engineering, and business advice to settlers.

Professor Weeks suggested that a plan patterned after the California State land-settlement act might be undertaken on a small scale as a demonstration by the Government, pointing out that the community plan should be followed for the following reasons:

1. Pioneering in irrigation is too big a job for one man.
2. People are not willing to settle on isolated tracts without neighbors.

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## THE LAND SETTLEMENT PROBLEMS OF THE SOUTH

By Hugh MacRae, Wilmington, N. C.

(The following is a brief summary of the address delivered by Mr. MacRae before the Conference on Reclamation and Land Settlement, December 14, 1925)

**T**HE South's land settlement problem is the problem of its future standard of civilization—of the well-being of its people—and thus, in a broad sense, the problem of the South, like that of the West, is national.

The perpetuation of our national institutions depends on a contented, virile rural population. Farming of a type which will provide contentment and happiness has now become a science and must receive general recognition as such. Tenant farming, except in instances so rare that they can be disregarded, is neither a science nor an art. It is a short cut, as time runs, to impoverishment of the land, the man on it, the landlord, and the Nation.

The problem is not to produce more cotton and more corn, not to compete with the present standards of agriculture, but to introduce new types of farming, and farmers who will diversify and make full use of the potentialities of soil and climate—men who love the land, who work scientifically, and who have been taught the economies of scientific farming through generations of old world necessities.

In actual practice, and so far as the experimental work in which I have been interested has gone, these exact benefits have developed. They are open to investigation by those who are interested in reaching a solution of this problem. The intensive farmer, occupying small acreage which he owns himself, diversifies and competes not at all with the staple crops of the country. He develops entirely new sources of wealth for the

section, and his beneficial influence extends to others. He employs the negro to good advantage, teaches him through experience better farm practices, and pays him double the wages which he had previously received as a farm hand.

The whole problem of land settlement and creating an agriculture which will appeal to people must be divested of exploitation. It is first, last, and all the time a human problem. The future of the family must not be measured in acres, nor in its value in dollars to others, but in its own well-being.

Farm communities, as contrasted with scattered farms, are so advantageous from every economic, scientific, and social standpoint that it seems queer we should even think of trying to settle land under any other method.

Perhaps the two greatest needs to permit of progress are—

### SOUTHWIDE CONFERENCE INDORSES RECLAMATION

The following resolution was adopted at the Southwide conference held in Birmingham, Ala., October 28 and 29, which was attended by Commissioner Mead:

"Whereas the relation of man to land is the fundamental economic and social question, and as all human experience shows this relation should be that of home and farm ownership, it becomes the duty of government to promote such ownership among its citizens, and

"Whereas the more easily available land has passed into the possession of private owners, it becomes the Government to make available other types of land for farm purposes; therefore be it

"Resolved, That this conference of southern governors and representatives from the Southern States go on record that reclamation by the Federal Government should proceed with reference to the problem to be solved and without reference to State or sectional lines. The same service and assistance, in proportion to need, should be available to each problem and the people of each such area; and be it

"Further resolved, That a copy of this resolution be furnished the Secretary of the Interior and all Senators and Congressmen."

(1) A usable system for extending necessary credit to the farmer on small acreage—a system created from the human viewpoint rather than from that of accepted financial usage.

(2) A supply of skilled farm families who will act as leaders and demonstrators.

Another problem is who is going to do the land settlement work? Who is going to maintain and possibly rebuild country life? If corporations undertake it with the principal thought of making profit, the families will fail. If they undertake it altruistically under present conditions, the corporations will fail. The possible profit will not pay for the necessary service and the overhead expense incident thereto.

Certainly until the public mind can be opened to this national need and until the principles of successful land settlement can be demonstrated to a point of general acceptance and appreciation, there will be needed cooperation between the Government and States and individuals. We need first to be shown that reclamation is one-tenth engineering and nine-tenths human; second, that every person in the United States should be interested in its successful outcome. The professional man and the banker are just as much interested as the commission man or the man who owns railroad securities.

The several departments of Government, with the help of the statesmen in Congress and with all available ability focused on this problem, can initiate a program which will result in a satisfactory solution. A new era can be started in country life, so that farming will be respected as a scientific vocation and one in which the standard of living will be conducive to contentment.

### SUN RIVER PROJECT BOY WINS WITH STEER

Elvin Barkoff, of Simms, Mont., son of one of the substantial farmers on the Sun River project, is making a name for himself as a raiser of prize-winning stock.

A yearling steer raised by Elvin recently won first prize at the North Central Corn and Livestock Show. He also won first in the boys' and girls' club work and first in the open classes. His premiums amounted to about \$65.

The steer at a little more than 1 year of age weighed 1,060 pounds and was sold to the Great Falls Meat Co. for \$86.

Aside from winning these substantial amounts of money, Elvin has stored up some very valuable experience in caring for stock.

### LAND SETTLEMENT PLAN

(Continued from page 5)

3. They must have confidence that their immediate neighborhood will settle quickly.

4. Financing, administration, and advice are facilitated.

5. Cooperation is more effective.

6. Unit costs of some large-scale undertakings are less than when done on a small scale.



## FROM THE "QUESTION BOX"

A NUMBER of questions were dropped in the "Question box" provided at the conference on reclamation and land settlement held in the Interior Department on December 14 and 15. The questions and answers to them are printed below:

**Question.**—If there is overproduction, why are things so high?

**Answer.**—The selling prices of agricultural commodities to consumers are generally high because of the high cost of distribution. Delivery services by merchants for trivial purchases add to the cost of commodities. Much of the distribution is unorganized in large centers. For example, it costs more to distribute a bushel of apples in New York than the freight on it from the State of Washington to New York. Likewise, the cost of distributing milk is often more than the price received by the farmer who produced it. Much has been done by farmers' cooperative marketing associations, but still more should and can be accomplished.

**Question.**—Just what steps can or should colonization men of carrier lines take to assist most efficiently in now settling reclamation projects?

**Answer.**—The first step should be to assist in the organization of the community for the purpose of colonization. This would include securing the cooperation of chambers of commerce, farm bureaus, and other interested groups, so that options may be obtained on desirable farms for sale at reasonable prices and under satisfactory purchase terms. Assistance should be provided for advertising these opportunities and field men should be assigned to obtain settlers. The advertising matter should be true as to facts and describe definite farms for sale. Excursion rates to projects having

an active settlement program would be helpful.

**Question.**—When is it probable that the interest rate on Federal farm loans may be lowered?

**Answer.**—The interest rate on these loans is dependent on the interest rate of the bonds sold by the Federal land banks. It is also dependent on the amount of real estate acquired by the land banks through foreclosure of mortgages. The loans tied up in these lands are a frozen asset until liquidated. The interest rate of the bonds is dependent on the bond market. Until land banks have disposed of their real estate very little change in the interest rate of Federal farm loans can be anticipated.

**Question.**—Can a uniform plan be equitably applied for the adjustment of present difficulties with settlers on the irrigated projects, or do the conditions for each differ making such an idea impracticable?

**Answer.**—Different projects require that different methods be employed to solve the problems existing on them. One project's greatest need may be settlers, another may face serious marketing problems because of transportation difficulties, and others may need drainage and soil improvement. Each project has special problems requiring special consideration.

**Question.**—What effect on the reclamation problem will the interest in agriculture shown by the President in his recent message have?

**Answer.**—It should have a favorable influence on working out the problems of reclamation.

**Question.**—Describe the settlement methods of Wisconsin.

**Answer.**—Although there are many different types of colonization enterprises in Wisconsin the plan generally referred to may be briefly described as follows: One large company purchased four tracts of land in 1917 aggregating 133,000 acres for colonization purposes. The main features are planned community development, repayment terms spread over 30 years, with interest at 7 per cent. Houses which cost from \$500 to \$850 are built by the company on farms. Two experienced field men give advice and service to settlers. Special inducements are made to expert farmers in specialized lines. Other companies are operating on similar lines. Financing is accomplished through mortgages which become the security for bonds which are approved by State authorities.

**Question.**—Describe the economic and State land soil surveys of Michigan.

**Answer.**—The surveys recently made in Michigan are combined economic and soil surveys for the purpose of determining what use shall be made of large areas of land which have reverted to the State through forfeited tax titles. The field data recorded by the surveyors include soil identification and distribution; character of surface and drainage; vegetation cover; economic conditions; resort and recreational possibilities; water-power resources; geological data; and stream data for fish, fur, and game. It is an inventory of natural resources and the economic factors involved to determine how the land may best be utilized.

## SPUDS BY THE YARD IN KITTITAS VALLEY

F. A. Kern, secretary of the Kittitas reclamation district, Washington, sends us the accompanying illustration showing some potatoes raised in the Kittitas Valley this year by R. E. Dyer.

Mr. Dyer produced 205 tons on 15 acres and was offered \$60 a ton for the crop. This is an average of 13½ tons of potatoes an acre and \$820 an acre gross return.

Oro McDermith, who was in the Washington, D. C., office when the illustration arrived, adds that 1,155 potatoes weighed a ton.



Potatoes from Kittitas Valley, Washington

## RESOLUTIONS READ AT CONFERENCE

THE following resolutions were read at the conference on reclamation and land settlement, held in the Interior Department December 14 and 15, and were made part of the record, no further action being taken on them:

### BY THE WESTERN RAILROADS

Whereas the various representatives of the western railroads having gathered to participate in the reclamation conference at Washington, D. C., December 14 and 15, 1925, it is hereby by them

*Resolved*, That they urge the Interior Department and the Commissioner of Reclamation to adopt a definite policy as to terms of the total construction charges for all western reclamation projects; and be it further by them

*Resolved*, That they promise their fullest cooperation in aiding the colonization of these lands in reclamation districts through solicitation, advertising, or any other method within their power.

### BY THE SOUTHERN RAILROADS

The representatives of the railroads attending this conference approve the expressed policy of the Secretary of the Interior and of the Commissioner of the Bureau of Reclamation to put reclamation projects on a businesslike basis.

If and when the appropriation of \$100,000 for investigational purposes mentioned by the Secretary becomes available, the railroads represented urge that exhaustive studies should be made of the matters of land utilization and settlement in the South.

BY HUGH MACRAE, WILMINGTON, N. C.

*Resolved*, That the Senators and Representatives in Congress be requested to amend the present restrictive immigration law, of which we approve in its general provisions, so that it will also be selective;

Further, that we ask our Senators and Representatives in Congress that they so amend the law that it will permit of the entry of persons skilled in agronomy, forestry, horticulture, or animal husbandry, under provisions as follows:

(a) In the issuance of immigration certificates preference shall be given by the consuls to persons who furnish satisfactory evidence that they are skilled in agronomy, forestry, horticulture, or animal husbandry, and who are going to the United States for the purpose of entering into agriculture, and to experienced farm laborers who are going to some agricultu-

ral district to engage in farming; that they shall be officially certified as to character and training in their own country, and they and their children shall have been taught the English language.

(b) Whenever the legislature or the governor of a State makes a request of the Secretary of Labor for farmers or skilled farm laborers who are expert in agronomy,

forestry, horticulture, or animal husbandry, of any nationality, for the purpose of filling a specific need in that State, the Secretary of Labor, with the Secretary of Agriculture, may make a review of the situation, and upon their approval the desired skilled farmers or experienced farm laborers who have received the certificate provided for in paragraph (a) may be admitted, subject to such regulations as will insure that they go to the specified localities, and under these conditions the said skilled farmers or expert farm laborers shall not count against the quota of the nationality involved.

## FARMERS, INVENTORY AND APPRAISE ALL YOUR LIVESTOCK, II

WE have previously urged our farmers to view their relations to their sons who are to help and later succeed them on the farm with a serious purpose to develop their youthful and latent character and abilities as "farmers in the making." They are, indeed, the most precious of all farm livestock, in comparison with which the single Aberdeen Angus fat steer which sold at Chicago recently for beef for over \$5,000 is scarcely worth inventory and appraisal.

There must be impressed upon these boys the meaning of farm life and of its certain advantages, for we may be sure its too apparent disadvantages will not fail to be brought to and exaggerated for their attention.

Then there may be other son or sons whose fitness is not for farm life, and whose character and ability may be worthy but lie in another direction. When first their father sees or feels the unfitness of a son to be his helper or successor his disappointment is natural and inevitable. A sober second thought must bring conviction, however, that the relation of mutual confidence and sympathy must be maintained in the interest of the farmer and his farm, as well as in the interest of his boy destined sooner or later to go forth to seek his fortune.

That this is for the true interest of the farmer and his farm a moment's thought must convince.

As the boy becomes established and sees about him in mill, factory, or office all the orderly and complicated processes of modern business, he is able, little by little, to contribute to his father's knowledge of business the broader and clearer views which his horizon, far wider than his father's, affords.

To village and county politics the boy can soon add a glimpse of those wider and, to his father, more obscure politics of the State and Nation.

To his father's often narrow social circle the boy can soon add from experience and observation his views of how different classes live and move and of their relation to each other.

These impressions of our business, political, and social systems which the son can impart in discussion on his home visits must leave behind, if the younger man's view is clear, more faith on his father's part in the justice and equity of our civilization. They will soften some convictions, release some prejudices, produce better understanding, and conduce to a more abiding confidence in the vast and complex system of which we are each and all an integral but tiny part.

That this mutual confidence and sympathy is in the interest of the son is equally obvious.

The first years from home test both character and good sense. To the exercise of these qualities nothing contributes more than the influence of home letters from brothers, sisters, and a devoted mother, in sympathy with the absent boy's ambition. An occasional visit home reinforces these influences, and when our city boy now becomes a man of family and sends his children, in turn, to draw their strength from vacations spent on the farm, part at least of a farmer's education soaks into their young and receptive minds.

"If the twentieth century is to be the century of conservation, the beginning of the ordered and permanent life of the Nation," farmers must assume the character of fixed cultivators, and their succession must be from the best fitted son in each generation to the best fitted son in the next.

It, therefore, is up to the farmer to exercise his influence and judgment in insuring such succession.

## ONIONS MAKE MONEY FOR GARMANS

*Fort Laramie division, North Platte project*



Sacks of onions grown by the Garmans

**L.** C. and R. L. Garman came to the North Platte project from eastern Nebraska in the spring of 1920 and purchased a tract of land containing 80 acres, located in Goshen County, Wyo., of which 68 acres were irrigable from the Fort Laramie Canal. At the time of the purchase they paid a portion down, and since then have paid the balance of the purchase price besides erecting dwellings and purchasing farm machinery and animals, all of which are now paid for out of the proceeds from the crops. They were raised on a farm in eastern Nebraska, but had never farmed under irrigation. The first year that they were on the project they broke out and planted all of the irrigable acreage in the tract, and each year since they have been among the highest producers in that section of the project.

During the year 1925 they planted 5 acres to potatoes, which produced a yield of 250 bushels per acre; 32 acres to sugar beets, which yielded from 18 to 23 tons per acre; and 12 acres of onions, which produced an average yield of 625 bushels per acre. The balance of the tract was in alfalfa and pasture. Each year since coming to the project they have planted a small acreage to onions, and their most noteworthy success has been along that line.

During the first year the yield of onions was very light, but each year since the results have been very satisfactory. Their methods are as follows:

The ground is plowed once in the spring as soon as the frost is out, then thoroughly pulverized with a harrow, beet roller, and a drag until it is as fine as flour, then floated and rolled again to make a firm seed bed. The field is then planted flat.

The seed is planted in rows to a depth of about a half inch. The first two rows are 12 inches apart, then a space of 18 inches is left to be plowed out for a ditch, then two more rows planted at 12 inches apart. This method is continued throughout the field, and provides for a double row of onions on the ridge and a furrow for every other row. If the ground becomes crusted from rain, before the onions are up a beet roller is used to break the crust. When the onions are 4 or 5 inches in height, the 18-inch space is furrowed out for a ditch which answers for a cultivation and is usually all that is necessary in the way of cultivation. This depends somewhat on the nature of the soil and weather conditions, as the soil must be maintained in a mellow condition until the onion tops are too high for cultivation. During the summer the field is carefully freed of weeds, but the onions are never thinned because the Garman Brothers learned that if the onions are so thick in the row that

they touch one another or even crowd one another out of the ground they are less liable to produce scullions (a scullion is an onion with a long thick neck which has no marketable value).

The furrow system of irrigation is practiced, and about four irrigations per year are sufficient to produce a crop. Very little water is applied at each irrigation, the intention being to simply moisten but never soak the soil, as soaking may result in a crop of scullions. When the onions have matured, which is about the last day of August or the first of September, they are then pulled out of the ground by hand and laid on the rows in the field to permit the tops to dry. After drying, the tops are pulled off by hand and the onions are sacked in the field and ready to be hauled to market.

The Garman Brothers state that one of the principal factors in the successful production of a crop of onions is the condition of the seed bed. Unless the ground is thoroughly pulverized so that each seed may have a firm bed and covering of soil, the seeds germinate at widely different times causing a thin stand of onions which result in a crop of scullions.

The per acre cost of producing a crop of onions is about equal to that of sugar beets. The Garman Brothers specialize in a Yellow Mountain Denver onion and plant 4 to 5 pounds of seed per acre. The seed which they have found to be the best adapted to this part of the country costs about \$2 a pound and was developed by a grower located at Delta, Colo. The planting is done by hand with a No. 3 Planet Junior seeder. The other work, such as weeding, pulling, and topping, is also done by hand.

The first four years the ground was not manured, but during 1925 it was given a light coating of fertilizer, and they have learned that manure causes the crop to mature and ripen sooner. During the spring of 1925 the plants were damaged by a frost on April 28, but in spite of that fact the average yield of onions was 625 bushels per acre, worth about \$1.55 per bushel on the Kansas City market.

The results obtained by the Garman Brothers show that they have devoted considerable time and thought to the study of conditions incident to the production of a successful yield, such as condition of soil, seed bed, weather, and moisture, and they are of the opinion that a small acreage well farmed is more profitable than a larger acreage where less attention would be given to the detail of caring for the crop.

The accompanying illustration shows the sacks of onions in the field before being hauled to market.

### FARMERS GENERALLY USE MARKETING AIDS

*There is every indication that farmers generally are using better business methods in handling and marketing their products. This is shown in the manner in which farmers have rebuilt their business from the depression of five years ago. It is shown also by the steadily increasing call for information on standardization and inspection of farm products, farm management, credit facilities, and both domestic and foreign market news.*

## AGRICULTURAL CONDITIONS ON THE PROJECTS

THE following is a summary of agricultural conditions on the irrigation projects of the Bureau of Reclamation, Department of the Interior, containing a review of the year's results and examples of large individual or project returns:

### YUMA PROJECT, ARIZONA-CALIFORNIA

Climatic conditions have been very good for the proper maturing of all crops. Picking of cotton continued heavy, with several thousand bales still in the fields, which indicates a larger crop than last year. Cotton ginned to end of month totaled 20,000 bales. A comparatively large acreage will yield over a bale to the acre, and a few places will yield nearly two bales per acre. The alfalfa industry is very profitable on this project. The seed yield averaged about 300 pounds per acre, from which the returns were from \$40 to \$50 per acre. One farm of 94 acres yielded 2 tons of hay, nearly 2 tons of straw, and 457 pounds of seed per acre. The gross returns from this crop amounted to about \$112 per acre. Lettuce has been a very profitable winter crop. The acreage was not large, but the average returns were above the average for the project.

Watermelons were grown on a comparatively small acreage and were marketed during May and June with very satisfactory returns. Cantaloupes were grown on about 800 acres this year. The yield was large, but so far as known only a very few realized a profit. Most of the growers marketed on a commission basis, and the returns did not pay marketing expenses. One farmer, who sold his crop outright from 35 acres, received \$7,000, and so far as known he is the only one who realized a profit. This crop was marketed during the peak of the marketing season of Imperial Valley, which was during a cool season of last June, when the demand was very poor. Up to November 1 more than 2,550 cars of produce had been shipped from the project, the gross returns from which amounted to \$2,710,700. The total gross crop returns for the project will be between four and a half and five million dollars.

### ORLAND PROJECT, CALIFORNIA

As was to be anticipated, the seasonal yield of alfalfa production was less than the average, being 3.6 tons per acre for 1925, as compared with the average of 4 tons per acre since and including 1911. The price of hay was quite satisfactory, maintaining an average of \$12.50 per ton for the season's production, so that the

crop value of \$45 per acre for the year practically equals the mean production of \$45.20 per acre since and including the first year of the project's operation in 1911. A less than normal yield of almonds was partially compensated for by exceptionally high prices for nuts. The yield of 195,780 pounds during 1925 on 1,153 acres of bearing trees is about 40 per cent of the production that might reasonably have been expected had the project trees not been subjected to the retarded growth and damage inflicted by the water supply shortage of 1924. The average yield of 170 pounds per acre for 1925 is the lowest in the history of almond production on the project and is attributable primarily to the water-supply shortage of the preceding year, combined also with the unfavorable weather conditions during the pollenization period in February. Advance reports of the orange production for 1924 are very optimistic. The seasonal production, which is being packed and marketed through the Orland Orange Growers Association, a local organization composed mostly of project growers, will amount to a total of approximately 9,000 boxes, representing a gross return of \$27,000, or \$99 per acre for the bearing acreage of 274. This return is somewhat greater—about 13 per cent—than the average annual return per acre to date since and including 1912. The local association plans to market this year's crop on the Pacific coast, thereby avoiding the high freight rates incurred in connection with consigning the product to eastern markets. The early shipments which were forwarded during the first week in November commanded the attractive price of \$5 per box f. o. b. cars at Orland.

Prunes, of which there were 354 acres of bearing orchards on the project during the year—the largest in the project's history—resulted in a seasonal production of 518,000 pounds and were sold at 7 cents per pound, which is about the usual price received for this project product. The seasonal production value of \$102.40 per acre for 1925 exceeds the average to date by about 12 per cent. As a result of damage sustained to stands during the 1924 drought, a considerable acreage of alfalfa was plowed up during the spring of 1925 and planted to milo, resulting in the relatively large area of 1,748 acres being devoted to this crop during the current season. The yield was exceptionally high in quantity, being 53 bushels per acre, which exceeds the average yield to date by nearly 50 per cent. Prices prevailing during Novem-

ber, after a not inconsiderable portion of the season's crop had made an appearance on the market, indicated that an average price of 85 cents per bushel may be confidently predicted for this year's crop.

Some 64 acres of project land were planted to cotton during 1925, mainly for experimental purposes. The Acala variety was planted upon the recommendation of the United States Department of Agriculture and the yield during the year has apparently proven the wisdom of the recommendation of specializing on this variety for the Sacramento Valley. Early prices received by the local growers were a fraction over 7 cents per pound for the raw product, which is equivalent to about 21 cents for the ginned cotton. Later quotations indicate a slight advance over these prices. It has been necessary to take the local product to Maxwell, 33 miles south of Orland, for ginning. The advance crop report for the project gives the results of cotton growing on the 64 acres to be a total production of 50 bales (500 pounds of ginned cotton per bale), valued at \$112.50 per bale, representing a total of \$5,625, or \$87.70 per acre cropped. The maximum yield was 0.9 bale per acre, the minimum 0.5 bale, and the average 0.75 bale. These data apply to the ginned product. Aside from the probable and considerable interference to the picking of the cotton in the fall of the year as a result of continued fall rains—a not unusual occurrence—the results of the year for the future of the cotton industry have been quite encouraging. The problem of sufficient labor during the season for picking will prove a difficult one in connection with an extensive acreage planted to this crop.

A new industry introduced into the Orland community during the year consisted of the operation by the Orland Kadota fig growers of a cannery for processing figs, mainly the Kadota variety. The cannery handled 71,800 pounds of fruit, which were processed in a variety of forms—viz, in glass jars, candied, and also preserved in tins. A fig syrup was also extracted and marketed. The price received by the growers was 4 cents per pound for the green fruit, resulting in a crop value of \$22.80 per acre for 125 acres of bearing trees. This appears to be a small return but, in reality, is a relatively high one in connection with trees, the oldest of which does not exceed three years. Kadota figs are noted for their early bearing. The cannery was a source of employment for considerable local labor, 25 women and 5 men being em-



played at the height of the season's operations. The pay roll amounted to something over \$2,800. A profitable market for the future production of the fig crop has been established during the year, and a bright future for this industry of the project seems assured. In general the agricultural results for the year on the project have been quite satisfactory and represent a partial recovery from the adverse effects of the unprecedented drought and water-supply shortage of the preceding year.

#### GRAND VALLEY PROJECT, COLORADO

Harvesting of all crops was practically completed, and the favorable weather permitted the digging of beets, etc., without loss from freezing. The entire crop of beets was out of the ground, but a considerable amount was piled at the various loading stations. The factory reported a heavy tonnage from the entire area and a very successful campaign has been in progress. The marketing of alfalfa hay has been slow, and the prices are not very satisfactory, the bulk of the crop moving at \$8 to \$11 per ton in the stack.

#### UNCOMPAGRE PROJECT, COLORADO

Conditions during November were excellent for the completion of harvesting operations and for fall plowing. Threshing of grain had been practically completed, and virtually all the sugar-beet crop had been harvested. The initial payment of \$6 per ton for sugar beets will be made on December 15 by the Holly Sugar Co. for deliveries made during November. The company announced that despite a decreased acreage in sugar beets this year the total yield will be approximately twice as large as it was during the season of 1924. The 1925 season was a good sugar-beet year, and as a result the average yield for 1925 will range somewhere in the neighborhood of 14 tons per acre, as compared with the average of 7.3 tons per acre obtained during the 1924 season. Harvesting of potatoes was completed, and much of this crop went into storage wherever storage was available in anticipation of better prices later on. Prices received by growers remained steady during the entire month, ranging around \$3 per hundredweight. The movement of the unsold onion crop amounted to little during the month on account of the low price which prevailed. The demand was unsteady; there were one or two spurts during which the prices offered ranged from \$1.75 to \$2 per hundredweight. These spurts only lasted a day or two at a time.

The wheat market continued to improve during the month. The prices

offered increased from \$2.05 and \$2.15 per hundredweight for the soft and hard varieties, respectively, at the beginning of the month to \$2.25 and \$2.55 at the end of the month. The project yield for this crop during the 1925 season was good, and as a result a goodly sum will be realized by project farmers. Good yields were also obtained from the oat crop. The price offered remained steady during the entire month at about \$1.35 per hundredweight. The annual State pure seed show was held at Colorado Springs from November 16 to November 20. At this show Uncompahgre project farmers carried off the following prizes: Second on certified Cobblers; first on seed plot Rurals and Idaho Rurals; second on Idaho Rurals; second on Red Winter and Red Spring wheat; third on Red Winter wheat; first on registered Minnesota No. 13 corn; first on not registered Yellow Dent corn; first on two-row barley; first on Rosen rye; third on field peas; third on Hubbard squash; first on Mountain Danvers onion seed. Competition was very keen in all classes at this show, and with this in mind the above showing is very creditable to Uncompahgre project farmers. At the International Livestock Exposition held in Chicago during the early part of December, John and George Howell, project farmers, exhibited in the grain class and were awarded the following prizes in competition with the entire United States and Canada: Fourth prize for sweet-clover seed; sixth and tenth prizes for rye; second and sixth prizes for oats; fourth and sixth prizes for winter wheat; fifth and sixth for white spring wheat.

The year 1925 was a very good year for project farmers, both with respect to yields and prices received generally for all crops. This condition was reflected in the cash repayment collections, which up to December 1 were more than twice as large as the collections for the previous year.

#### BOISE PROJECT, IDAHO

Practically all crops other than corn had been gathered and the threshing of seed was about completed. Hay was bringing \$7 a ton in the stack. At the end of the month a large share of the hay was unsold, but greater demand was expected as the fall pasture is fed out. There was an active inquiry for potatoes, but only a few sales were being reported. Most of the potatoes on hand were being held. One potato grower was holding 1,500,000 pounds of his potatoes for expected higher prices. The following are a few examples of large individual returns: O. W. Bunton, \$7,800 from 37 acres of apples and 10 acres of prunes; Walsh and Warntjes, \$9,500 from 37 acres

of apples; Roger W. Batt, 4,450 bushels of potatoes from 13 acres, and 900 bushels of barley from 15 acres; J. W. Briggs, 3,000 bushels of onions from 6 acres; W. E. Thompson, 600 bushels of wheat from 12 acres.

#### KING HILL PROJECT, IDAHO

All crops were moving except hay and corn. The corn, however, not sold will be fed on the farms. Hay was quoted at \$5 to \$6 with no buyers. The weather has been open and no stock was in sight to consume the surplus hay.

#### MINIDOKA PROJECT, IDAHO

The 1925 crops are all harvested, the last of the sugar beets being dug during November. Prices on farm products have become pretty well established, and it is therefore possible to make an approximate estimate of the results of the year's farming operations. This is particularly true of the South Side pumping division, upon which the crop and livestock census has been completed. The summaries will show a cropped area in the pumping division of about 42,000 acres, a total crop value of close to \$2,400,000 and an average crop value of approximately \$57 per acre. These figures indicate an increase of about 1,200 acres in the cropped area and practically 100 per cent increase in productive value over last year's record, and the total agricultural returns are the best of any in the history of the South Side tract except those for 1919. It is believed that at least a \$3,000,000 crop has been obtained on the Gravity division of the project this year.

An analysis of the crop reports for the South Side shows some interesting trends in farming practice, the most outstanding of which was the large increase in the area devoted to grain growing largely at the expense of the acreage in sugar beets. The area in wheat alone increased 3,700 acres, and the area planted to sugar beets decreased 3,240 acres. This transition may be accounted for both by the attractive price prospect for wheat in the spring and by the comparative failure of the beet crop last year on account of insect damage. The alfalfa area increased about 350 acres in 1925, but a much heavier increase is expected for 1926, as many wheat fields were seeded. Grains other than wheat increased 540 acres.

The biggest money-producing crop in 1925 was potatoes. The area in this crop on the pumping division was 3,782 acres, as compared with 3,430 acres in 1924; the average yield, as shown by

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## AGRICULTURAL CONDITIONS ON THE PROJECTS

(Continued from page 11)

reports given by the growers, was 230 bushels per acre, and the average unit price was \$1.35 per bushel. It is therefore seen that the average gross return per acre was about \$310. Guy Olin, living 4 miles south of Burley, raised 10,000 bushels of potatoes on 25 acres. On his 80-acre farm he raised crops to the value of \$15,470, an average value on the 77 acres of net area cropped of \$201 per acre. W. R. Gierisch, living just across the road from Mr. Olin, had but 10 acres in potatoes, but he raised crops to the value of \$6,000 on 40 acres. Numerous other farmers obtained production values of over \$100 per acre upon the entire area cropped, while potato values ran as high as \$750 per acre in some cases. These figures are based upon average prices already received and now prevailing upon potatoes. A large part of the crop is still in storage and is expected to bring a better price than is now offered. Quotations per hundredweight on the staple crops are as follows: Wheat, \$2.25; oats, \$1.25; barley, \$1; potatoes, Gem, \$2.50; Rurals, \$2.40. Hay in the stack is selling for \$7 per ton and at the alfalfa meal mills for \$8 per ton.

### HUNTLEY PROJECT, MONTANA

The field work in securing the crop returns was practically completed, and, while the total returns have not as yet been tabulated, the work has progressed sufficiently so that a safe estimate of the gross return may be made. It is thought

that, allowing only the minimum or contract price for beets (\$6.50 per ton), the gross return will equal that of 1924, amounting to \$768,658. F. R. Seely produced crops with a gross value of \$1,735 from 31.8 acres, or \$54.59 per acre. Fred Balzer produced crops with a gross value of \$2,536.65 from 35¼ acres, or \$71.96 per acre. George Mechalis produced crops with a gross value of \$2,361 from 29½ acres, or \$80 per acre. The results obtained by Harmon Althoff, a renter, show that high returns are not necessarily dependent on the sugar-beet crop. On 29 acres devoted to alfalfa, beans, garden, onions, straw, and stubble he produced crops with a gross value of \$1,867.20, or \$64.38 per acre.

### MILK RIVER PROJECT, MONTANA

Threshing of small grains and alfalfa seed was practically completed. Harvesting of sugar beets was continued under difficulties practically throughout the month, owing to frost in the ground. It is estimated, for the project as a whole, that probably more than 30 per cent of the beet acreage will not be dug on account of freezing. Frost also materially cut the yield of potatoes, but the loss is probably made up by the increased unit value over other years, the present price being 3 and 3½ cents per pound. Good yields of alfalfa seed were reported. Shipments amounted to more than 101 carloads of beets, 66 carloads of hay, 172 carloads of wheat, 3 carloads of flax, and 1 car of potatoes.

### SUN RIVER PROJECT, MONTANA

The favorable weather conditions during November made it possible to finish threshing and other farm work that had been suspended since the 19th of September. The sugar beets have been harvested. Practically all the potatoes have been saved. The ground was covered with snow during the coldest weather, which protected potatoes that had been well hilled. The damage to wheat was not as great as anticipated. A good deal of the wheat threshed since the storm will be docked only one grade, and the worst of it will take about fourth grade, which at present prices is worth about \$1.25 per bushel. The following shipments were made from the project during the month: Forty-four cars of sugar beets, 21 cars of alfalfa, 7 cars of potatoes, 15 cars of wheat, and 4 cars of cattle.

### LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

The favorable weather during November enabled farmers to reduce the percentage of beets frozen in the ground from about 30 per cent to less than 10 per cent of the total crop. Lifting had been suspended, and it was estimated that 6,000 to 8,000 tons of beets remain in the ground. The yield this year was as good as the average. Alfalfa hay was finding a ready market with those feeding livestock at prices ranging from \$7 to \$10 per ton, with the average at about \$8. Unfortunately very few potatoes were planted, so that the high price of this crop does not materially help this project. Peas and beans yielded fairly well and sold at a good price.

### NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The crop returns on the project have so far shown very satisfactory results, the indications being that the average crop value per acre will exceed any year since the project was operated with exception of those years when war prices prevailed. The Great Western Sugar Co., which operates four sugar factories in the valley and contracts for over 50,000 acres of sugar beets, the greater portion of which are grown on the North Platte project, has announced a preliminary estimate giving an average yield per acre of 16.4 tons. This exceeds by 3 tons any previous average in this district, and it is believed to be a world's record of sugar-beet production on an area of 50,000 acres. Individual yields in some instances are



Hauling sugar beets to the dump, Strawberry Valley project, Utah

running as high as 26 tons, with a great many exceeding 20 tons per acre. This high yield is explained by the crop rotation system developed on the project which has brought about a high fertility of soil, by a very favorable growing season, and by the campaign of the sugar company for better farming methods.

The potato crop has been one of exceedingly gratifying returns. At the time the crop was harvested the price ranged from 85 cents to \$1 per bushel. This has increased until at the present time potatoes are being marketed at \$2.10 per bushel f. o. b. shipping point. As the yield per acre on this project was better than ordinary, some very excellent returns are being received. A good many fields have harvested 350 bushels per acre and some 400. The alfalfa crop has been as good or better than average, there being no trouble experienced with grasshoppers and very little hail damage during the season. Prices have averaged about \$8 to \$8.50 per ton in the stack, and at the present time there is but very little hay unsold on the project except that which is to be fed by the farmer. Grain yields for the season have been very satisfactory and fair prices have been secured. However, there has been practically no grain sold except wheat, which has been shipped out of the valley, the oats and barley being fed locally. The corn crop has been average for this territory with a price which is rather below the average. The quality of corn is not all that could be desired, though it is very good for feeding purposes. Several miscellaneous crops have shown good returns, such as onions, beans, and cucumbers. However, these are in such small acreages that they do not affect the total to any great extent.

#### NEWLANDS PROJECT, NEVADA

The winter-wheat crop is reported to be in excellent condition. The Middle West alfalfa hay market was announced to be closed to project hay by quarantine regulations on account of the presence of alfalfa weevil. It is hoped that these restrictions may be amended in so far as alfalfa meal is concerned. The inability of project farmers to dispose of their alfalfa hay in outside markets on account of weevil quarantine restrictions, together with the low sale price for hay, have served as a stimulus to the dairy industry.

#### CARLSBAD PROJECT, NEW MEXICO

A small percentage of the last crop of alfalfa was damaged by frosts. The prevailing price of alfalfa hay was \$25 per ton. Cotton picking was continued without interruption, and approximately

95 per cent of the crop had been picked at the close of the month. Cotton ginned to date, which includes the crop from a few private irrigation plants adjacent to the project, totaled 11,660 bales as of November 30, 1925. The price of lint cotton ranged from 18 to 20 cents a pound.

#### RIO GRANDE PROJECT, NEW MEXICO-TEXAS

Reports from the different cotton gins over the project show that approximately 62,000 bales of cotton had been ginned to November 28, which indicates a total return from the lands within the project of over \$8,500,000 from this commodity, an increase over the season of 1924 of more than \$1,500,000. In addition to the return from project lands proper, it is estimated that a return of over \$750,000 will be realized from this crop on Warren Act lands below the project, which receive water from Elephant Butte Reservoir. The prices being paid this season for both cotton and cottonseed are somewhat under those of last season, but at the present prices of 22½ to 23 cents there is a substantial margin of profit for the grower where proper attention is given to the culture of the crop. Alfalfa produced a normal yield, with prices ranging from \$16 to \$25 per ton, according to grade. This crop, in the main, will grade higher than in former years, due to many grass-infested fields being planted to cotton. Dairy men have

experienced a very successful year, this industry consuming a very large part of the surplus alfalfa hay crop. All fruit crops produced a good yield, with satisfactory prices throughout the season. A good yield was realized on cantaloupes, but the price was below normal, and it is the general belief that the crop as a whole returned very little net profit to the growers.

#### UMATILLA PROJECT, OREGON

During the winter of 1924 subzero weather with no snow covering the ground froze out a considerable quantity of alfalfa. The acreage would be hard to estimate, as the result of the freeze showed up during 1925 in many dead patches in the fields, a considerable decrease in yields resulting. The price of alfalfa during the current year has been good, ranging from \$10 to \$12 per ton in the stack. As 90 per cent of the project is in alfalfa and pasture, its prosperity depends mostly on alfalfa crops and to what use it is put. Those depending entirely on the sale of alfalfa, and they are numerous, are far from prosperous. Butterfat and eggs have produced good prices throughout the year, and dairy men and poultry raisers who understand their business have been receiving good returns for their work. Butterfat during November fluctuated between 54 and 57 cents and eggs between 44 and 50 cents. There was a limited acreage in potatoes, cantaloupes, and melons. One water

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An irrigated potato field on the King Hill project, Idaho. Potatoes were an exceptionally remunerative crop this year

## AGRICULTURAL CONDITIONS ON THE PROJECTS

(Continued from page 13)

user sold \$800 worth of potatoes from 2 acres, another received \$1,260 from 6 acres of cantaloupes, and still another \$800 from 5 acres of melons. These instances of good returns were received by men who are fundamentally stockmen, feed most of their hay on the farm, and return the fertilizer to the fields. Asparagus, which was planted in small plots here and there over the project in 1924, showed a good, and in some instances, where well fertilized by barnyard manure, luxuriant growth. This crop will begin to derive returns in 1926, and hopes are entertained that another money-making crop has been added to the project.

### KLAMATH PROJECT, OREGON-CALIFORNIA

The alfalfa crop was below the average owing in part to considerable areas being winter-killed. Damage was also done by cutworms. The area in potatoes approximated 2,000 acres, or 500 acres more than last year. An August frost materially reduced the yield of some fields. The average amounted to 80 to 90 sacks of United States No. 1, and about 25 sacks of No. 2, with some small potatoes in addition. Forty-five cars of No. 1 have been shipped, and about the same number of standards. Some potatoes have not yet been dug, and appreciable quantities are being held for higher prices. The price recently has been \$2.50 or more at Klamath Falls.

The Tule Lake leased lands produce the principal grain crops of the project. These lands are flooded in the spring and after that do not receive any water other than subirrigation from the flow of Lost River. Some good crops have been obtained during the past season. The average and best crops are reported as follows: Wheat, 5,620 acres, produced 122,600 bushels, an average of 21.8 bushels per acre (the largest yield reported was 50 bushels per acre from 400 acres); oats, 3,150 acres, produced 137,700 bushels, an average of 43.7 bushels per acre (the largest yield reported was 15,000 bushels from 80 acres, or 187.5 bushels per acre); rye, 3,550 acres, produced 67,730 bushels, besides 2,500 tons of hay (the largest yield reported was 6,000 bushels from 120 acres or 50 bushels per acre); barley, 7,100 acres, produced 185,000 bushels, besides 700 tons of hay (the largest yield reported was 32,300 bushels from 442 acres, or 73 bushels per acre). Under the Klamath drainage district, Mr. Motschenbacher reported 46 bushels of rye per acre from 378 acres, Mr. Chin Lung

(a Chinaman) reported about 3,044 bushels from 130 acres, and Mr. Lane reported about 12,200 bushels from 450 acres. The crops of Chin Lung and Lane were more or less damaged by sheep.

### BELLE FOURCHE PROJECT, SOUTH DAKOTA

All crop returns on the project show up well for the past season. Sugar-beet yields are attracting particular attention. Large fields of 20 to 30 acres produced in the neighborhood of 23 tons per acre and small fields report as high as 30 tons. Harvesting was delayed by bad weather in October, and the beet dump remained in operation until November 30. Five hundred and thirty carloads have been shipped from project towns, or a total of about 21,000 tons. Corn husking is about over, and with prevailing open weather the livestock have had good pasture on the rough feed. Considerable corn has been shredded for winter cattle feed, some has been shelled for market, and perhaps one-third was consumed by sheep and hogs in the fields. There is a good local demand for corn, and none has been shipped to distant markets. Alfalfa hay continues to move slowly at \$6 to \$7 in the stack, although several sales of 100 to 200 tons have been made to sheep men both on and off the project.

### STRAWBERRY VALLEY PROJECT, UTAH

At the close of the month all crops had been harvested with the exception of about 5 to 10 per cent of the sugar beets. The tonnage of sugar beets to be handled by the three project factories is estimated at 105,000 tons, with average sugar content of about 16 per cent. The price of wheat advanced slightly during the month to \$1.30 per bushel, while oats and barley remain about stationary. About 3,000 tons of alfalfa hay are being shipped to Texas points, with prices ranging from \$11 to \$11.50 per ton, baled, f. o. b. the cars. As a result a lot of old-stock hay is being marketed at a fair price. The season of 1925 was one of the best experienced on the Strawberry Valley project in many years. It was due primarily to an excellent and extended growing season with an abundance of early rains which insured germination and good stands, and also to regular intermittent storms each month, which refreshed the crops and broke any long continued spell of hot weather. Though the natural run-off of all streams was below average, yet the excess rainfall during the season made up to some extent this loss. The extremely low temperatures during the

winter of 1924-25 killed or injured many peach and early fruit trees, with the result that the peach crop was practically a failure and the cherry crop reduced to about one-third the average.

The yields of all other crops have been average or above average, and the prices received for them sufficient to return reasonable profits. The area under specialized crops, such as peas, string beans, and tomatoes for canning purposes, increased to 1,600 acres, with some individual returns in excess of \$200 to \$300 per acre. The sugar-beet crop was exceptionally heavy, averaging over the entire area approximately 13.6 tons per acre, with individual yields in some instances as high as 25 tons per acre. The hay and grain crops were also good and are being sold at fair prices. The gross value of all crops produced on the project will be slightly in excess of \$2,000,000 from 55,000 acres of irrigable agricultural lands, representing about 41,000 acres cropped wholly or in part under project water rights, yielding about \$43.50 per acre, and 14,000 acres of other agricultural lands under other independent water rights, yielding \$36.50 per acre. The total returns for the irrigation season of 1925 show an increase over those of the previous season of about \$300,000, or \$6.50 per acre over the entire project area.

### OKANOGAN PROJECT, WASHINGTON

From the data on hand it appears that the apple crop will only be about 50 per cent of what it should be normally. Prices are fairly good, and many of the orchardists will make some money for this season. A few on the project have made a good showing for this season. Where the trees had sufficient water during the past irrigation season the orchardists claim that many fruit spurs have developed and that prospects are good for an excellent crop next year.

### YAKIMA PROJECT, WASHINGTON

To the close of November almost 19,000 cars of farm products had been shipped from the Yakima Valley, being composed chiefly of the following: Apples, 7,570 cars; pears, 2,490; potatoes, 3,554; hay, 4,567; onions, 368; mixed vegetables, 261; total, 18,810 cars. The potato market remained firm at \$55 to \$60 a ton, and satisfactory prices are quoted for all other kinds of farm produce. A greater percentage of the total crop produced, both on the Yakima project and in the Yakima Valley as a whole, has been shipped to market than in previous years.

**RIVERTON PROJECT, WYOMING**

The only project land under irrigation and cultivation in 1925 was 80 acres located south of Pilot Butte Reservoir, owned by Robert K. Warren. This area of raw land was seeded to oats, and the yield is estimated at 2,400 bushels, or an average of 30 bushels to the acre.

**SHOSHONE PROJECT, WYOMING**

November was an unusual month in that while there were no storms of any consequence and the temperature was equable, yet the prevailing temperature was 2° below normal, and being on an average below freezing caused the ground to become frozen seriously on the 6th and remain so thereafter. As a result, while it was possible to proceed with threshing and even stacking hay that had been in the windrow or shock for six weeks, the sugar-beet harvest was stopped except in a few favored localities, and there remain in the ground about 80 acres of such crop on the Frannie division and 210 acres on the Garland division, respectively, about 20 and 10 per cent of these crops. The October storms did less damage than was anticipated to the third cutting of hay on the Garland division, but on the Frannie division more of the storms fell as rain instead of snow, with the result that much third-cutting hay was badly damaged.

There are no reports of loss of potatoes by being frozen in the ground, and damage to unharvested peas and beans except in a few cases where carelessness prevailed was not serious. No damage to grain crops by storm is reported except in a few isolated cases where late crops were not cut before the storms began. In general crop yields are good, exceeding those of last year, and in the case of sugar beets the increased yield will probably result in as many tons per acre being harvested for all acres planted as was harvested last year in spite of the frozen-in losses.

On the Garland division an estimate of the cash crops of 1925 as compared with 1924 shows an increase of about \$100,000. Of this increase it is estimated that \$45,000 has been cashed, while the remainder represents anticipated profits from potatoes in storage and unsold hay. As respects this division, 1925 is expected to be the best year since 1919. The only sore spot is the sugar-beet situation. Besides losses on account of beets frozen in the ground, the growers of this crop were put to unusual expense in getting out what they did save by reason of muddy fields and roads and disagreeable weather, and are also faced with a low price for sugar, with the consequent probability that there will be very little bonus to add to the guaranteed price of \$6.50 per ton.

For a time the hay situation also looked very dark, as the State of Missouri, in which is located Kansas City, the project's principal hay market, placed an embargo on all hay shipped from Wyoming on account of the presence of the alfalfa weevil in the State. By energetic action of a hay growers' committee and the State agricultural commissioner it was possible to convince the Missouri authorities that there was no weevil in the Big Horn Basin, and the embargo was lifted with respect to it. The Chicago, Burlington & Quincy Railroad also granted an emergency hay rate to Kansas City and certain other points, which cuts the standard rates from 80 cents to \$1.50 per ton. The Peters Milling Co. began operating their alfalfa mill at Powell on the 13th. They are paying \$10 per ton for bright hay, having contracted 1,000 tons at this price earlier in the season. Two portable alfalfa mills also were in

operation during the month. They pay \$9 per ton for the best hay. A third mill is being assembled and will also soon be in operation. The common price for hay bought to be fed on the farm is \$8 loose, which is also about the price for baled hay after allowing for baling.

On the Frannie division conditions are similar to those on the Garland division, except that a large area in Polecat Valley has no first cutting of hay because of the May and June hailstorms and that there is only a very small acreage of beans and no peas, both of which were remunerative crops on the Garland division. In spite of the various adversities it is believed that the 1925 crop production will exceed that of 1924. The following carload shipments of produce were made during the month: Alfalfa hay, 54 cars; alfalfa meal, 35; potatoes, 24; beans, 8; beets, 258; oats, 1; wheat, 4; honey, 1.

**WASHINGTON STATE AID PROJECT**

A RECENT issue of the Engineering News-Record contains an interesting statement concerning the White Bluffs-Hanford land settlement project, a Washington State-aid colony on the Columbia River about 50 miles north of Pasco and 20 miles east of Priest Rapids, Wash., from which the following is extracted:

The colony was selected expressly for irrigation, is favorably located with respect to markets, has an average growing season of 204 days, and matures crops earlier than any other locality in the State.

The raw land was purchased by the State at an average price of \$18.50 per acre. Before the settler goes on the land the State selects the location for a well or wells, sinks them, and equips them with motor-driven pumps of sufficient capacity to supply the needs of the area included in the farm. Of the 100 tracts on the project, 62 have been colonized and developed in whole or in part.

Settlers are required to have had some experience in farming and to have at least \$1,500 or its equivalent in credit.

The State also constructs on each tract a three-room plastered cottage with ample porches and concrete cellar, a 16 by 30 foot combination barn and cow shed, and a small modern poultry house.

Where the settler desires it, additional financial aid for clearing, leveling, seeding, fencing, fluming, etc., can be arranged for, and where necessary the State will pay the power bill for the first three years.

The total investment by the State in land, buildings, improvements, and power bills (in cases where the settler elects to

accept all financial aid available) amounts to approximately \$5,000 per 20-acre tract. Toward this amount the settler is required to make an initial payment of \$612.50. During the first three years of operation it is assumed that this is a development period, and for this reason the State requires only payment of pumping charges and interest upon the investment made by the State. The settler's annual payments thus approximate \$18.40 per acre allocated as follows:

Interest on balance due State (4 per cent of \$4,387.50)-----	\$175.50
Power for pumping, \$35 for 5.5 horsepower (minimum)-----	192.50
Total-----	368.00

Beginning the fourth year it is expected that the settler will have derived some return from the development of his tract, and whatever is his balance at this time is amortized into 20 equal annual payments, amounting to \$7.36 per year on each \$100 of indebtedness, which constitutes an amount which will discharge interest and principal in 20 years. The average annual charge per acre is approximately \$25.73 and on a 20-acre allotment is made up as follows:

Amortization of unpaid balance and interest due State-----	\$322.00
Power for pumping-----	192.50
Total-----	514.50

The settlers now on the project are devoting about one-half of their acreage to feed for dairy cows, hogs, and chickens, and the remainder to early fruit and vegetables.



## ORGANIZATION ACTIVITIES AND PROJECT VISITORS

**R.** F. WALTER, chief engineer, and George C. Kreutzer, director of reclamation economics, have spent a number of days in the Washington office in connection with the hearings on the appropriation bill and the conference on reclamation and land settlement.

Russell R. Hornberger, assistant engineer in the Denver office, was transferred to the Yuma project on November 2.

W. C. Christopher, assistant engineer in the Denver office, was transferred to the American Falls Dam, Minidoka project, on November 8.

Charles R. Menefee, storekeeper, was transferred from the Riverton to the Yuma project, reporting for duty on November 12, to fill the vacancy caused by the resignation of Harry J. Keiling.

Oliver P. Morton, employed by the Orland Unit Water Users' Association, spent several days recently on the project in connection with the Stony Creek water right adjudication suit.

Sr. Ignacio L. Figueroa visited the Grand Valley project recently and inspected the principal structures on the irrigation system. He was particularly interested in the methods of water delivery and the operation and maintenance organization with a view to the adoption of some of the methods in the reclamation work to be undertaken in Mexico.

Superintendent Page and Engineer Blackmer of the Grand Valley project visited the Uncompahgre project on November 21 to inspect the ditch-cleaning work of the Ruth dredger.

O. W. Israelson, professor of irrigation and drainage at the Utah Agricultural College, with a number of students, inspected the work at American Falls Dam recently. Professor Israelson tries to make such a trip with a portion of his classes nearly every year, visiting irrigation projects that are accessible and thus giving his students first-hand information as to the methods of construction and operation and maintenance.

Superintendent of Construction S. O. Harper visited the Huntley project in November, looking over the main features of the canal and lateral system. He also visited the Milk River, Sun River, Lower Yellowstone, and Belle Fourche projects.

### ORLAND WATER USERS MAKE LARGE PAYMENT

*On December 1, 1925, the Orland Unit Water Users' Association turned over to the local fiscal agent the sum of \$48,399.22 as a partial repayment on the 1925 construction charge, the total of which amounts to \$66,552.92. This leaves only a 27 per cent delinquency in the payment of the 1925 charge.*

*Collections through the project office during November were similarly gratifying, \$5,960.80 having been collected, itemized as follows: 1924 construction installment, \$4,010.88; 1924 operation and maintenance charge, \$521.71; 1925 excess water charge, \$460.52; interest and miscellaneous, \$967.69.*

*Commissioner Mead has written to Superintendent Weber as follows:*

*"Your reports of the collections of water-right charges, both current and past, are most gratifying. I have no doubt that the Orland project, through the combined efforts of yourself and the directors of the Orland Unit Water Users' Association, will soon regain its past record of a '100 per cent' project."*

Engineer Walter L. Drager has completed his assignment on the St. Mary storage, Milk River project, investigating reservoir possibilities, and has returned to the Denver office.

District Counsel R. J. Coffey was on the Newlands project in November to attend to Truckee and Carson River water-right adjudication suit.

Mrs. Ethel Mary Cavanaugh, junior clerk, Carlsbad project, has resigned.

The clerical force on the Rio Grande project was reduced recently by the resignation of R. A. Parsons, storekeeper,

whose duties have been combined with the work of other employees.

Andrew Weiss, assistant director of reclamation economics, has been making Hermiston, Umatilla project, his headquarters, in connection with his review of the report on the Umatilla Rapids project.

T. R. Smith, junior engineer, has been transferred from the Klamath project to the American Falls Dam.

Julian Hinds, engineer and chief draftsman of the Denver office, has been on the Klamath project recently, making detailed examinations and adjustments of the installations at Gerber Dam for the investigation of strain in the dam. These investigations are being carried on under the direction of the special committee on arch dams of Engineering Foundation, on which Mr. Hinds is the representative of the Bureau of Reclamation.

Superintendent Lytel, Yakima project, made a trip recently to Olympia to furnish information to the board of directors of the Kittitas district in connection with proposed legislation affecting the division. A number of conferences were held with the secretary of the district on progress of the work, furnishing information on various features and plans of procedure.

E. E. Roddis, district counsel, visited the Shoshone project recently to attend the hearing in regard to the formation of the Shoshone irrigation district.

Ralph C. McCreary, index clerk in the mails and files section of the Washington office, resigned recently and is succeeded by Malcolm J. Annadale.

The Secretary of the Interior has named Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, to represent the Interior Department respecting the disposition and apportionment of the water of the Columbia River and its tributaries under the provisions of Public Act 609, Sixty-eighth Congress.



# NEW RECLAMATION ERA

VOL. 17

FEBRUARY, 1926

NO. 2



BOULDER CANYON RESERVOIR DAMSITE ON COLORADO RIVER  
(See article, page 20)

*Better Farming  
Better Business  
Better Living*

*BETTER farming simply means the application of modern science to the practice of agriculture. Better business is the no less necessary application of modern commercial methods to the business side of the farming industry. Better living is the building up, in rural communities, of a domestic and social life which will withstand the growing attractions of the modern city.*

*Sir HORACE PLUNKETT*

*In "The Rural Life Problem of the United States."*

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HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

FEBRUARY, 1926

No. 2

## HIGH LIGHTS IN A REVIEW OF THE MONTH

**S**UPERINTENDENT LAWSON, of the Rio Grande project, broadcasts the 1925 crop results in the following telegram: "Crop report Rio Grande just completed shows total gross value yield both districts Hudspeth County and Mexico \$12,605,000. Elephant Butte and El Paso districts produced \$10,680,000. Increase over last year of approximate million in spite of half million loss due to flood."

**T**HE gross crop returns in 1925 from the Grand Valley project amounted to \$693,000, or \$52.89 an acre, as compared with \$46.60 an acre in 1924. In addition, the irrigation districts which obtain water from the project system had returns estimated at \$1,150,000. The net income over the entire valley is probably higher than in any year since the war.

**T**HE crop report on the Boise project showed a return of \$35.14 per acre. The average return was lowered by the prices received for alfalfa, barley, and oats, which comprised about half the acreage planted in 1925 on the project. The higher returns were received from potatoes, amounting to \$172 per acre, and onions, \$363 per acre.

**A** FIELD of timothy and red clover, seeded on the Uncompahgre project 32 years ago, which has produced abundant crops each year and from which more than \$45,000 worth of hay has been produced, is one of the outstanding evidences of fertile soil and productivity in the Uncompahgre Valley.

**T**HE total gross value of crops grown in 1925 on 4,414 acres on the Okanogan project amounted to \$945,406, or \$214.18 per acre, principally from the apple crop. From 4,038 acres in this crop, the total yield amounted to 796,600 boxes, valued at \$1.13 per box, giving a total value of \$900,158, or about \$223 per acre.

**T**HE Yakima Valley reports the most prosperous agricultural year in its history. Crop returns for 1925 totaled more than \$47,000,000 from 350,000 acres.

**C**ROP values for 1925 on the Belle Fourche project totaled \$891,000, an increase of \$294,000, or 49 per cent, over the previous year. Sugar beets made an extraordinary record, producing an average yield of 16.1 tons per acre, or twice that of the previous year. A number of farms produced above the 20-ton mark, and several small fields reported up to 30 tons per acre. Project beet growers realized \$120,000 in cash, or \$97 per acre from the beets, and it is estimated that bonuses and beet tops will bring the total return to \$133 per acre.

**W**ELL cared for pickle patches on the Belle Fourche project yielded 250 bushels of cucumbers and over per acre. The L. J. Townsend farm near Nisland reported \$553.20 in cash received from 1 acre, and other farms reported returns in the neighborhood of \$400 per acre.

**O**N December 31, 1925, operation and maintenance of the King Hill project was turned over to the King Hill irrigation district.

**P**POTATOES held in storage for expected advances in price, representing about 20 per cent of the crop on the Uncompahgre project, are valued at \$350,000 to \$400,000. The gross value of all crops on the project for 1925 amounted to \$3,032,000, or an average of \$49.47 per acre cropped.

**T**HE Laabs cheese factories on the Minidoka project have added a new product to their output. The manufacture of Swiss cheese has been inaugurated at the Burley, Rupert, Paul, and Deelo factories, made up in 60-pound and 200-pound drums.

**L**AST year 950,000 pounds of butterfat were produced on and marketed from the Newlands project, in addition to the production from approximately 1,000 cows which was consumed by farm families and town retail trade. The average price paid at the local creamery was 52.3 cents, or 9.1 cents higher than in 1924.

**T**OTAL collections on construction and operation and maintenance charges on the Newlands project amounted to \$209,104 in 1925 as compared with \$152,158 in 1924, or an increase of nearly \$57,000. A more optimistic spirit is evident among project farmers than for several years past.

**T**HE total 1925 crop value on the Gravity division, Minidoka project, was \$2,539,667, compared with \$1,446,284 in 1924. On the South Side Pumping division the total was \$2,382,423, compared with \$1,185,910 in 1924.

**T**HE Sun River project crop report for 1925 shows an average value per acre of \$21.82 for the Fort Shaw division and \$19 for the Greenfields, or an increase of 50 per cent over the average value of the past four years and the best showing since 1919.

**U**NDER a recent decision of the Comptroller General of the United States, the deduction of a fee from the pay of employees, for the purpose of maintaining a fund for furnishing medical and hospital service not covered by the employees compensation act, has been discontinued, beginning January 1, 1926, and the bureau will not be liable for any such obligations incurred by its employees.

**A**PPROXIMATELY 600 new automobiles were purchased by water users on the Minidoka project last year, in addition to a large number of used cars.

**PRELIMINARY CROP REPORT, FEDERAL IRRIGATION PROJECTS—1925 (EXCLUDING WARREN ACT LANDS)**

Project	Acreage cropped		Value of crops		Value of crops per acre cropped	
	1925	1924	1925	1924	1925	1924
Salt River	217,900	215,430	\$22,456,642	\$22,091,850	\$103.05	\$102.55
Yuma	55,801	53,120	4,718,485	4,504,090	84.56	84.80
Orland	11,330	9,970	504,580	224,950	44.55	22.57
Grand Valley	13,110	12,600	693,320	587,430	52.89	46.60
Uncompahgre	61,294	62,100	3,032,395	1,941,600	49.47	31.26
Boise	93,695	111,050	3,323,775	2,708,740	35.47	24.40
King Hill	5,960	6,070	183,320	224,630	30.76	37.04
Minidoka	95,755	91,060	4,922,092	2,633,190	51.40	28.91
Gravity division	53,840	50,340	2,539,667	1,446,280	47.17	28.73
South side pumping division	41,915	40,720	2,382,425	1,186,910	56.84	29.15
Huntley	19,310	19,770	744,875	827,520	38.57	41.86
Milk River	18,495	14,530	277,395	177,360	15.00	12.21
Sun River	26,400	30,590	534,810	401,690	20.25	13.13
Fort Shaw	7,730	8,140	168,670	111,460	21.28	13.69
Greenfields and Big C division	19,270	22,450	366,140	290,230	19.00	12.93
Lower Yellowstone	18,275	14,030	642,160	548,400	35.14	39.10
North Platte	160,965	129,140	5,137,716	3,511,650	31.91	27.19
Interstate	84,120	80,910	3,169,210	2,343,110	37.68	28.96
Fort Laramie	67,420	39,060	1,764,935	991,720	26.18	25.38
Northport	9,425	9,170	203,571	176,820	21.60	19.28
Newlands	37,170	40,760	1,034,975	1,405,120	27.85	34.47
Carlsbad	22,861	23,070	1,433,059	2,239,900	62.69	97.10
Rio Grande	121,800	103,120	10,676,615	9,624,570	87.65	93.34
Umatilla	12,850	12,510	363,811	334,860	28.32	26.76
Klamath	33,367	32,710	671,670	792,570	20.13	24.23
Main division	31,850	31,520	633,265	762,890	19.90	24.20
Tule Lake division	1,517	1,190	38,405	29,680	25.31	25.00
Belle Fourche	53,120	49,810	891,250	597,090	16.78	11.98
Strawberry Valley	41,300	41,040	1,789,33	1,519,160	43.32	37.01
Okanogan	4,415	3,950	945,405	699,600	214.13	177.11
Yakima	101,574	102,680	12,004,067	8,118,640	118.18	79.06
Sunnyside	78,474	78,130	8,978,767	4,923,820	114.42	63.02
Tieton	23,100	24,550	3,025,300	3,194,820	130.97	130.16
Shoshone	36,325	36,320	930,450	713,500	25.61	19.64
Garland	29,625	29,600	810,855	617,230	27.46	20.86
Frannie	6,700	6,720	119,595	96,270	17.85	14.41
Total	1,263,672	1,215,430	77,912,197	66,128,110	61.65	54.41
Increase over 1924	48,242		11,784,087			
Per cent of increase	3.96		17.8		13.3	

<sup>1</sup> Includes a portion of Warren Act lands.

## MODEL IRRIGATED FARM

*Lower Yellowstone Project, Mont.-N. Dak.*

**A**N opportunity was presented at the Richland County fair, held last fall at Sidney, Mont., to advertise the work of the Bureau of Reclamation and at the same time to assist the water users of the project in better farming methods through the medium of a miniature irrigated farm. Two principal objects were kept in mind in the preparation of this exhibit. The first was to show a crop rotation that would make a completely diversified agricultural program and the second to show various methods and systems of irrigation adapted to the crops grown and the topography of the land. Judging from the interest shown in the exhibit it was well worth while.

The model farm was prepared 6 feet by 12 feet in size, representing an 80-acre unit. The various fields were laid off to scale and seed was planted in advance of the fair so that all crops were actually growing. A small placard was placed in each field giving the number of acres and information as to what was planted there last year and what would be planted next year.

The surface was purposely left with uneven topography in order to illustrate different systems for irrigation. The field lateral, border, and contour systems were shown. Miniature canal structures were placed in the ditches and their use explained. Water was supplied to the head ditch from a hose and the fields were irrigated several times a day. A gravelled highway, fences, farm buildings, lawn, shade trees, etc., were details added to assist in the impression of a complete farm home.

The crop-rotation scheme was based on 15 acres of sugar beets and 20 acres of alfalfa each year. By plowing up  $7\frac{1}{2}$  acres of alfalfa each year and seeding a like amount, beets would be grown two years in succession and alfalfa approximately three. Four acres were reserved for buildings, kitchen garden, shrubs, etc., and five acres for pasture.

The first year after plowing up the alfalfa, corn would be planted in order to have a crop susceptible of vigorous cultivation to kill the alfalfa. Following corn would come beans, a profitable crop and one in which corn stubble is not so objectionable as in beets. Next would come sugar beets for two years followed by one year of wheat. After the wheat, oats or barley would be planted and used as a nurse crop for new alfalfa. If desired to shorten the rotation period, the beans and wheat can be omitted.

**T**HE Mapleton irrigation district, Strawberry Valley project, has transmitted a warrant for \$4,228.33 in full payment of its delinquent 1924 construction charges.



Model irrigated farm on the Lower Yellowstone project, Montana-North Dakota

## BOARD OF SURVEY AND ADJUSTMENTS MAKES REPORT

*Secretary Work, in transmitting report to Congress, states that if all grievances and sources of loss enumerated under subsection K are disposed of at this time, the obligations assumed by water users should hereafter be discharged in full*

**E**STIMATING losses on Federal reclamation projects at a total of \$27,102,287 due to lack of fertility of the soil for which irrigation works were constructed, inadequate water supply, and other physical causes, the report of the Board of Survey and Adjustments has been submitted to Congress by Secretary Work.

Projects included in the survey upon which the Government has sustained losses number nineteen. Of the total \$27,102,287 the board fixes \$14,317,150 as a definite loss and recommends that this amount be charged off, while \$12,735,137 is given as a probable loss with recommendation that this sum be placed in suspense account.

In his letter of transmittal to Congress, Secretary Work stated he was unable to approve of some of the recommendations contained in the report because it was believed that they were not within the scope of their authorization under subsection K of the law providing for the survey or that they introduced principles which would render future development so hazardous and uncertain as to destroy or seriously interfere with the administration of the reclamation act. He explained further that these exceptions were more important as to principles than as to the money involved and that they would be explained if such explanations were desired by Congress. The Secretary also stated in his letter that bills designed to carry out those recommendations in which the Department concurred were in the course of preparation. Continuing the Secretary said:

"The fact that the relief recommended is above the estimates contained in the fact finders' report, which led to this survey, should not operate against its favorable consideration by Congress. It is reported as desirable that all grievances and sources of loss enumerated under subsection K be disposed of at this time. If this is done the obligations assumed by water users on these projects should hereafter be discharged in full."

The Board of Survey and Adjustments in submitting its report asserted that the welfare of the projects would be greatly promoted by the early disposition of its recommendations. "Human lives are being worn out unnecessarily in the futile attempt to win a living from lands without productive value, many of which can not by any known means be brought into profitable cultivation. These people, fighting against insurmountable odds,

should receive immediate relief. On several of the projects real or fancied errors in the fixing of acre costs cause distrust and dissension. An early settlement of all such matters will hasten the development of good feeling and constructive efforts on the projects.

"The projects generally are in prosperous condition. The Federal venture in irrigation promises success. There should be fewer difficulties in future operations under the reclamation act, if the experience of the past be heeded. The losses, as indicated by this report, are large, but we have felt that we would serve best, by stating fully and frankly the conditions brought to our attention. Fancied security is dangerous.

### RECLAMATION

*"The reclamation funds are derived from western lands.*

*"Not a dollar comes from the taxpayer's pocket.*

*"The fund is being repaid.*

*"The reclamation fund is revolving.*

*"Domestic markets are created in a large way for domestic goods.*

*"Reclamation distributes and equalizes our population.*

*"It makes for national defense.*

*"It creates wealth, puts worthless lands on the tax rolls of the various States, and makes Federal income-tax payers by the thousands.*

*"And best of all—reclamation brings settlers to the farm, the best abode for man."—From speech by Hon. John W. Summers, of Washington, in the House of Representatives, January 7, 1926.*

"You will observe that the total losses as recommended by us are somewhat larger than those suggested by the fact finders. This is due chiefly to the discovery of lands without productive power, by the detailed survey of this year, which were not known to the fact finders. Otherwise, our findings and those of the fact finders are in very close agreement. On some of the projects a contractual surplus or accumulated profits will partly offset the losses. That does not, however, change the fact that the resources of the project are diminished by the sums represented by the losses as recommended in this report. The water now appurtenant

to lands recommended for exclusion may in the future become a source of revenue to offset the losses herein recommended."

A tabulated summary of the losses on the projects surveyed by the board follows:

Project	Probable loss	Definite loss	Total loss
Belle Fourche.....	\$734,618	\$544,521	\$1,279,139
Boise.....	495,369		495,369
Carlsbad.....	45,867		45,867
Grand Valley.....	1,344,409	760,628	2,105,037
Huntley.....	719,642	168,981	888,623
King Hill.....	287,024	531,958	818,982
Klamath.....	62,711	170,684	233,395
Lower Yellowstone.....	607,017	382,254	989,271
Milk River.....	1,878,656	1,946,189	3,824,845
Minidoka.....	132,787	9,172	141,959
Newlands.....	813,264	4,536,396	5,349,660
North Platte.....	2,599,987	237,877	2,837,864
Okanogan.....	99,473	720,700	820,173
Rio Grande.....		43,158	43,158
Shoshone.....	534,006	1,715,666	2,249,672
Sun River-Fort Shaw.....	131,940	125,531	257,471
Umatilla.....	484,088	1,054,940	1,539,028
Uncompahgre.....	1,436,155	1,365,427	2,801,582
Yakima.....	378,124	3,068	381,192
Total.....	12,785,137	14,317,150	27,102,287

The Board of Survey and Adjustments was appointed in January, 1925, and spent the greater part of last year in making a comprehensive and detailed study of the Federal reclamation projects. Its members included: Thomas E. Campbell, chairman, southern board; John A. Widsøe, chairman, northern board; F. M. Goodwin, Reclamation Bureau representative; Andrew Weiss, Reclamation Bureau representative; E. O. Aylesworth, representing Colorado; Warren G. Swendsen, representing Idaho; I. D. O'Donnell, representing Montana; George E. Condra, representing Nebraska; George B. Thatcher, representing Nevada; H. L. Kent, representing New Mexico; W. A. Delzell, representing Oregon; B. F. Myers, representing South Dakota; M. M. Moulton, representing Washington; and A. J. Martin, representing Wyoming.

During the past year there were large increases in the number of horses, sheep, and fowls on the Minidoka project, Upwards of nine carloads of dressed poultry were shipped from Burley and Rupert this past fall, bringing the growers \$65,000.

Feeding operations on the Lower Yellowstone project are the most extensive in the history of the project. Stock made some remarkable gains and the industry will show good returns.



## BUILDING OF BOULDER CANYON PROJECT RECOMMENDED

*Proposed development includes dam 550 feet high, creating a reservoir holding 26,000,000 acre-feet of water; works for generation of electric power; and an all-American canal starting at Laguna Dam and delivering water to Imperial and Coachella Valley canals*

CONSTRUCTION of the proposed Boulder Canyon project for the protection and development of the lower Colorado River at an estimated cost of \$125,000,000 through a bond issue by the United States has been recommended by Secretary Work in a report submitted to the Senate Committee on Irrigation and Reclamation.

Suggesting modifications in the present Senate bill, the Secretary declared that the general plan and purpose of the measure, which was to regulate and control the flow of the river below the dam to prevent floods, to increase the water supply for irrigation, to provide domestic water supply, to generate electric energy and contribute to the general prosperity of the southwestern part of the country, had his support as a national undertaking to be carried out and administered by the Federal Government. Stating that the Federal Government should preferably be entrusted with the protection of such rights or distribution of its opportunities, or with its international relations he said that all uses of the undertaking can be coordinated and the fullest benefits realized best by central control. If the proposals in the Secretary's report are adopted, protection of the upper Colorado River States is assured.

Discussing the building of the project through a national bond issue, Secretary Work asserted that it should be a sum sufficient to provide for the construction of the dam, the power plant and the all-American canal and that an additional sum should be included in the authorization to pay interest on bonds sold during the period of construction and until such time as the revenues will meet interest charges. Providing the money for this development through a special bond issue, he continued, would obviate disturbance of the regular fiscal operations of the Government and would also obviate provision by the Budget for the money needed during construction. The bonds could be sold as the money would be needed, the construction extending over a period between 5 and 10 years, if work were carried on at a rate to secure the greatest efficiency.

The Secretary expressed opposition to the allotting of power privileges, as proposed in the Senate bill, and advocated the building of a unified power plant by the Federal Government as more efficient and cheaper resulting in the elimination of controversies between applicants and

long delays in their adjustment. Continuing he stated that the area for the location of separate plants was restricted and allotments would not be equal in value. Some allottees, therefore, would have an advantage over others, which would result in the creation of operation and administration controversies that unified development by the Government would avert.

Transmission lines for the distribution and retailing of electric power from the Government central plant, the report proposed, should be financed by the purchasers. To secure the greatest economy, main transmission lines leading to different localities should be constructed for joint use. This plan of power development, the report asserts, is not an experiment having been adopted by the Federal Government with satisfactory results in the construction of other reclamation works, where the generation of power is incident to irrigation development. Salt River, Minidoka, Lahontan, and Guernsey were cited in illustration.

The report also discusses at length the proposed All-American Canal, pointing out that the existing contract with the Mexican Government gives the use of half of all the water diverted to that country and suggests the revision of this agreement, the sale of water for domestic uses and for the irrigation of lands under the provisions of the reclamation act and the Warren Act. In conclusion, Secretary Work presents a financial statement showing the estimated capital investment and annual operating expenses and receipts under the proposed plan of construction and operation through a Federal bond issue.

The total cost of the project is estimated at \$125,000,000 including \$41,500,000 for a 26,000,000 acre-foot reservoir, \$31,500,000 for 1,000,000 horsepower development, \$31,000,000 for the All-American Canal, and \$21,000,000 for interest during construction on above, five years at 4 per cent. The annual gross operating revenues are estimated at \$12,300,000 of which \$10,800,000 would accrue from the sale of 3.6 billion kilowatt hours of power at 3/10 cents and \$1,500,000 from storage and delivery of water for irrigation and domestic purposes. The fixed annual charges are estimated at \$6,200,000 representing \$700,000 for operation and maintenance, storage, and power; \$500,000 for operation and maintenance of the All-American Canal; and \$5,000,000 for interest on

\$125,000,000 at 4 per cent. The annual surplus is estimated at \$6,100,000, thought to be sufficient to repay the entire cost in 25 years. The report in full follows:

"I have received your letter of December 23, transmitting, with request for report, a copy of S. 1868, entitled 'A bill to provide for the protection and development of the lower Colorado River Basin.'

"Instead of discussing the provisions of this bill, section by section, I desire to submit some suggestions regarding the policy and procedure to be followed in this development and the legislation required to secure the desired results. It is assumed that the dam and reservoir to be created are essentially those described in a report of the Bureau of Reclamation dated February 28, 1924, which proposes a dam 550 feet high, and a reservoir to impound 26,000,000 acre-feet of water, and that the All-American Canal for connecting the Colorado River with the Imperial and Coachella Valleys is substantially the one described in Senate Document No. 142 and in the report of the All-American Canal Board published in 1920.

"It is my understanding that the primary purpose of this scheme is to regulate and control the flow of the river below the dam, so as to lessen the menace from floods to low-lying land below, to increase the water supply for irrigation in seasons of drouth, and provide an adequate water supply at all seasons of the year for household and industrial uses in growing cities and towns, and to generate electric energy both as a means of making this project a financially solvent undertaking, and contributing to the general prosperity of the southwestern part of the country. The general plan and purpose of this measure has my support, and I favor it being made a national undertaking, to be carried out and administered by the Federal Government.

"Interstate and international rights and interests involve the diversified benefits from the construction of these works the waiting necessities of cities for increased water supplies, the large development of latent agricultural resources, the protection of those already developed, and the immense industrial benefits which may come from the production of cheap power, which together appear to render the construction and subsequent control of these works a measure of such economic and social importance, that no agency but the Federal Government should be intrusted with the protection

of rights or distribution of its opportunities. All uses can be coordinated and the fullest benefits realized only by their centralized control.

"I shall therefore consider this development as including three features:

"(1) A dam approximately 550 feet high creating a reservoir holding 26,000,000 acre-feet of water.

"(2) Works for the generation of electric power.

"(3) An all-American canal starting at Laguna Dam and delivering water to the Imperial and Coachella Valley canals.

"The reservoir should be regulated, primarily to safeguard the valleys in Arizona and California, including Imperial Valley with its present extensive development from the destructive effect of large floods. Water levels in the reservoir would be raised during flood periods and lowered at other times, thus equalizing the discharge of the river below and securing a regulated flow for irrigation and power. The water so impounded should be sold to cities requiring it for domestic purposes and other municipal uses and to irrigation districts, like that of the Imperial Valley, desiring a complete or supplemental water supply under the provisions of the Warren Act, payment to be made for a definite volume of water each year.

"The electric energy generated should be sold to the highest and best bidders, with due regard to public interest, at the switchboard of the power plant. Contracts should not exceed 50 years in duration. Transmission of power and its distribution to be provided by the purchasers.

"Water supplied for domestic, industrial, or irrigation uses should be delivered at the dam, at points along the river agreed upon, and at the terminal of the all-American canal. Prices for this water should be such as to at least repay all of the cost of operation and maintenance of the canals and an equitable part of the operating expenses of the dam. This, with the revenues from power, will, we believe, repay the entire investment in this development with 4 per cent interest.

"The money for this development should, I believe, be provided by a bond issue of the United States. It should be for a sum sufficient to provide for the construction of the dam, the power plant, and the all-American canal. An additional sum should be included in the authorization to pay interest on bonds sold during the period of construction, and until such time as the revenue will meet interest charges. Providing the money for this development through a special bond issue will obviate disturbance of the regular fiscal operations of the Government. It will obviate provision by the Budget for the money needed during con-

struction. The bonds could be sold as money would be needed. Construction would extend over a period of between 5 and 10 years if work were carried on at a rate to secure the greatest efficiency.

"In the sale of water to irrigation districts and municipalities, the provisions of the reclamation act and of the Warren Act would apply.

"Such an adjustment of burdens and benefits should stimulate irrigation development because of the generous terms on which water will be supplied, and at the same time result in a considerable revenue from the water furnished for irrigation, domestic and industrial uses. But the money-earning feature of this development is power. The revenues from the sale of power will, it is believed, alone repay the entire cost of these works with interest at 4 per cent.

"With this general outline of the development program favored, I submit comments on features of the bill which are approved and others which it is believed should be modified.

"The necessity for the all-American canal and the size and cost of this canal depend largely on whether the existing concession under which water is now diverted from the Colorado River at Hannon's Heading and carried through Mexico to irrigators in the Imperial Valley can be modified. If it can not be then the all-American canal becomes an indispensable part of this development. Under this contract, or concession, the Mexican Government gave a corporation permission<sup>1</sup> to build and operate a canal across Mexican territory to irrigate land in California on condition that Mexican irrigators be given, if they desire it, one-half of all the water diverted into this canal from the Colorado River. Hence, the canal has to be double the capacity required to meet the needs of California. The river has to supply double the water needed in California and the rights of Mexicans to water under this concession grow as the irrigated area is extended in California.

<sup>1</sup> The Sociedad de Riego y Terrenos de la Baja California S. A., is authorized to carry through the canal which it has built in Mexican territory, and through other canals that it may build, if convenient, water to an amount of 234 cubic meters (10,000 cubic feet) per second from the waters taken from the Colorado River in territory of the United States by the California Development Co., and which waters this company has ceded to the Sociedad de Riego y Terrenos de la Baja California S. A. It is also authorized to carry to the lands of the United States the water with the exception of that mentioned in the following article."

"From the water mentioned in the foregoing article, enough shall be used to irrigate the lands susceptible of irrigation in Lower California with the water carried through the canal or canals, without in any case the amount of water used, exceeding one-half of the volume of water passing through said canals."

"The canal now supplies water for the irrigation of over 400,000 acres in California, and irrigators in Mexico at present require water for the irrigation of 200,000 acres. But Mexican irrigators are entitled, under this concession, to double the volume they are now using, or for enough to irrigate as many acres as are now irrigated in California. That is more water than the unregulated flow of the river will now supply. As the Mexican irrigators are on the upper end of the canal, the pinch of scarcity, when it has come in the past, or when it may come in the future, falls first on irrigators in the United States, which country supplies the water, all the construction cost and all the money advanced for operation. It is unfair to California irrigators now, and will be even more so after the reservoir is built.

"It is physically possible to irrigate much more than 400,000 acres from this canal in Mexico. If this concession remains in force without any amendment and the canal continues to be used as now, the irrigated area in Mexico will continue to extend. The volume needed to be diverted from the river would be more than the direct flow at the low water season, and the area irrigated in California would be subject to ruinous uncertainties and loss. If storage is provided, a part of the water for the irrigation of lands in Mexico would, under this concession, have to be supplied from the reservoir, as this canal would be the only means of conveying water to the Imperial Valley and it can be operated only if the terms of the Mexican concession are complied with.

"If, however, the Government of Mexico would consent to a modification of this concession and definitely limit the volume of water to which Mexican irrigators would be entitled, then the future use of the present canal would be economical and desirable, a smaller high line could be built and utilized mainly for the irrigation of the higher lands of the Imperial and Coachella Valleys. Thus far, no negotiations for the modification of this concession have been made. It is not known what the attitude of the Mexican Government would be, and plans for this development should therefore include provision for an all-American canal as an essential part of the scheme.

"The building of a unified power plant by the Federal Government in the place of allocating power privileges, as proposed in the bill, is regarded as more efficient and cheaper. It will obviate controversies between applicants, and long delays in their adjustment. In the end, results will, I believe, be superior to those possible under an allocation of

(Continued on page 22)

# BOULDER CANYON PROJECT

(Continued from page 21)

privileges. The area for the location of separate power sites is restricted. Allotments would not be equal in value. Some allottees would, therefore, have an advantage over others. It would result in the creation of operation and administration controversies to be avoided and which a unified development will avert.

"The transmission lines for the distribution and retailing of this power should be financed by its purchasers. To secure the greatest economy, main transmission lines leading to different localities should be constructed for joint use. This plan of power development is not an experiment. It has been adopted by the Government with satisfactory results in the construction of other reclamation works, where the generation of power is an incident to irrigation development. Salt River, Minidoka, Lahontan, and Guernsey are illustrations.

"Section 6 provides that no part of the construction cost of the dam and the appurtenant works shall be charged against any lands irrigated by the waters of the reservoir. If the all-American canal is to be considered as an appurtenant work, the bill should be amended. It is believed that the sales of water from this canal will return not only the cost of operation and maintenance, but pay construction costs without interest, as is done on other reclamation projects.

"All revenues from power, irrigation and domestic water supplies should be placed in a common fund and used for the payment of interest, operating expenses and build up a sinking fund for redeeming the entire bond issue.

"In order to give assurance before any large expenditure is incurred that the anticipated revenues from this development will be obtained, the bill should contain a provision that before any bonds are issued and sold and before awarding any contracts for construction, the Secretary of the Interior shall secure the execution of contracts with irrigation districts, municipalities, and corporations, on terms to be fixed, for the delivery of all water to be supplied for irrigation, domestic, and municipal uses, and shall obtain definite commitment for the purchase of power from responsible bidders in an amount to insure a sufficient return from this development to repay the money to be expended with interest within a period of 50 years.

"Section 8, which provides for the distribution and use of all water for irrigation, power, and otherwise, in accordance with the Colorado River compact, seems well conceived and is a necessary part of this legislation. This appears to

afford ample protection and assurance to those States included in the upper division of the watershed against the creation of a priority of right through the building of these works which would impair in any way their right to the volume of water guaranteed to that division in the compact. I suggest for consideration amendment to the effect that the benefits to be derived from this development shall be available only to those States or the citizens of those States which have ratified the compact.

"I suggest the amendment of section 9 as follows: In line 1, page 11, strike out the words 'the proportionate share' and insert in lieu thereof the words 'an equitable share in accordance with the benefits received.' After the word 'lands' in line 15 insert 'subject, however, to the provisions of subsection o of section 4, act of December 5, 1924 (43 Stat. 702).' The first amendment suggested is designed to avoid the necessity of fixing a flat-rate charge without regard to the classification or quality of the land. Experience has shown that a flat-rate charge is undesirable in some cases. The second amendment I believe of prime importance. If soldiers and sailors are to be given a preference, experience has shown that provision should be made for selection. This is desirable for the protection of all prospective entrymen, soldiers and sailors, as well as civilians.

"Since section 1 provides for the building of a dam either at Black Canyon or Boulder Canyon, I suggest that line 11, section 10, be amended so as to designate the subfund there mentioned as the 'Colorado River Dam fund' which would be applicable in either case. The present designation might possibly prove a misnomer. I suggest the following proviso be inserted at the end of section 10 of the bill:

"Provided, however, that no work shall be begun and no moneys expended on or in connection with the works or structures provided for in this act until the respective legislatures of at least six of the signatory States mentioned in section 13 hereof shall have approved the Colorado River compact mentioned in said section 13, and shall have consented to a waiver of the provision of the first paragraph of article 11 of said compact making the same binding and obligatory when it shall have been approved by the legislatures of each of the seven signatory States, and until the President, by public proclamation, shall have declared that the said compact has been approved by and become binding and obligatory upon at least six of the signatory States."

"An approximate estimate of cost, operating expenses, and income leaves no

question as to the ultimate solvency of this undertaking if carried out along the lines proposed. The main source of revenue will be power and the rate assumed is lower than the wholesale prices now being paid in the West. Those of which we have information range from 3½ to 8 mills per kilowatt-hour, measured at the switchboard. As the largest consumers of this power would be distant, a low figure of 3 mills per kilowatt-hour at the switchboard has been assumed in the estimates which follow:

## Colorado River development, Boulder Canyon Reservoir, all-American canal

### CAPITAL INVESTMENT

Estimated cost for:	
25,000,000 acre-foot reservoir.....	\$41,500,000
1,000,000 horsepower power development.....	31,500,000
The all-American canal.....	31,000,000
Interest during construction on above, five years, at 4 per cent.....	21,000,000
<b>Total.....</b>	<b>125,000,000</b>

### ANNUAL OPERATION

Estimated gross revenues from:	
Sale 3,600,000,000 kilowatt-hours, power at ½ cent.....	10,800,000
Storage and delivery of water for irrigation and domestic purposes.....	1,500,000
<b>Total.....</b>	<b>12,300,000</b>
Estimated fixed annual charges for:	
Operation and maintenance, storage and power.....	700,000
Operation and maintenance, all-American canal.....	500,000
Interest on \$125,000,000 at 4 per cent.....	5,000,000
<b>Total.....</b>	<b>6,200,000</b>

Estimated annual surplus, \$6,100,000, or thought to be sufficient to repay the entire cost in 25 years.

"The height of this dam as fixed will not prevent the construction of the proposed dams at Diamond Creek or Bridge Canyon. The approval of this project should open the way for other development, and encourage the construction of projects above this dam for development of irrigation, power, or other purposes.

"Although the difficulties of construction and magnitude of the proposed structure compared with any other for similar purposes are unprecedented, assuming that it is a feasible engineering possibility, the Reclamation Bureau of the Department of the Interior, as now organized, with its present commissioner, is competent to construct the works contemplated in S. 1868.

"With the amendments suggested, I recommend the favorable consideration of this bill by Congress."

THE value of crops grown on the Sunnyside division of the Yakima project in 1925 amounted to \$8,978,770, or \$114.42 per acre, compared with \$4,923,820, or \$63.02 per acre in 1924. On the Tieton division the value in 1925 was \$3,025,200, or \$130.97 per acre, compared with \$3,194,820, or \$130.16 per acre in 1924. For the project, as a whole, the increase amounted to nearly \$4,000,000.

## CONSERVATION OF WATER ESSENTIAL

*Elephant Butte Irrigation District approves more efficient system of water deliveries by rotation instead of by demand, with a view to preventing distribution wastes and conserving water for the increased project acreage under cultivation*

*Editorial from the Rio Grande Farmer*

**T**HERE has been a great deal of discussion recently among project farmers of the matter of improving water deliveries. Probably this subject has received more attention during the past season than in all the previous history of the Rio Grande project.

During the past season an attempt was made to work toward an efficient rotation system of deliveries. It is proposed by the Government to take further steps toward this end during the coming season, with a view to perfecting the most practical system of rotation.

This policy has had the approval of the great majority of project farmers, but now and again one hears some expression of fear that this system will hamper some particular type of farming.

The rotation system of deliveries does not in any sense contemplate the enforcement of harsh rules to that point where any particular type of farming will be eliminated or hampered. Rotation, according to the plans proposed, will not prevent the vegetable farmer from carrying on his business, as apparently is feared by a few project farmers.

While it undoubtedly is true that under certain conditions a demand system of irrigation will prove satisfactory, it is also true that under other conditions it is absolutely necessary to adopt a system of rotation. The latter undoubtedly is the case in the Rio Grande project.

The history of this project shows that where little regard is paid to a system of rotation approximately 40 per cent of the water taken from the reservoir is wasted down the stream. It is inconceivable that this condition can continue, now that the project is nearing complete development and all lands soon will be irrigated. The project area of 155,000 acres, when all in cultivation, will not permit of such waste, and the ultimate utilization of both our water and power assets demands that steps be taken to secure the greatest possible efficiency in the use of water, thereby reducing the discharge necessary at Elephant Butte.

Every thousand acre-feet of water that is lost means a decrease in the possible agricultural production of the project, and it means a decrease of at least \$750 net in potential annual power receipts. Such waste, of course, ultimately would greatly endanger our land values as well as our

power prospects. Further, the canals of this project, although of much larger capacity per acre served than in many other irrigated sections, are entirely inadequate to serve the project acreage unless there is a systematic system of deliveries. We have seen, during the past year, that the irrigation peaks, partially due to the desire of all farmers to get water at the same time, occasioned some distress which could have been all alleviated by a little more system in rotation.

Rotation means better service because water users can plan their work more exactly, knowing when they can secure their water, and it also undoubtedly will mean closer supervision of the water where it is checked up, with a consequent lessening of ditch breaks.

It can readily be understood that because of varying conditions on different projects, a rotation system is of much more importance in one project than it may be in another. In a long shoe-string project, such as the Rio Grande, where some parts of the project are distant about seven days from the source of regulation and supply, it becomes especially necessary that rotation be practiced, as the great daily variation in different sections under a demand system must be obviated as nearly as possible in order to permit the close regulation at the reservoir that is necessary to prevent waste.

The figures on last season's run-off of the Rio Grande basin show that the water supply during the past year was one of the lightest on record. Up to November 30, only 374,000 acre-feet came into the reservoir, and during the same period there was discharged from the reservoir more than 800,000 acre-feet. In addition, there were other heavy losses within the reservoir, due to evaporation and other causes. Not since 1902 has there been such a meager annual flow at San Marcial. Engineers who are thoroughly conversant with the normal run-off and with the reasoning that led to the construction of the Elephant Butte reservoir to its present capacity, agree that wisdom dictates that we should now make every attempt to prevent the waste of water and initiate further economies to provide for the future rapid expansion of the project's irrigated

area. This means nothing more than a policy of adopting the refinements of water deliveries which are found now in all sections where the water supply has been generally appropriated and has become valuable.

The regulations put into effect during the past year, although only a start in the right direction, produced gratifying results. In spite of an increase in the area irrigated of practically 20,000 acres, the discharge at Elephant Butte was reduced nearly 200,000 acre-feet. The estimated discharge at Elephant Butte for 1925 is 814,137 acre-feet. Government engineers estimate the safe annual draft on the reservoir to be 720,000 acre-feet. In other words, we should still cut the discharge 96,000 acre-feet.

The theoretically controllable waste below the project last year was 179,652 acre-feet. It is believed that by cooperation between the Reclamation Service and the water users in elimination of waste, the project can, without suffering undue hardships, accommodate its demands to the established safe annual draft.

It is borrowing trouble, either for an individual or an irrigation district to draw on its assets faster than there is possibility of their being replenished. As business men and as prospective power merchants, water users find it necessary to take a business-like view of the situation.

The cooperation of the farmers of the project will greatly hasten a solution of the water delivery problem. One of the things most strongly urged upon the water users is the benefit to be gained by starting the season with clean and properly constructed ditches and farm laterals, in order that they will take water in quantities best adapted to efficient and prompt irrigation. Much of the dissatisfaction expressed in the past by farmers who had difficult irrigation would have been obviated, it is claimed, if they had anticipated their summer needs and had prepared their ditches so that they would have ample capacity for the irrigation demands of their farms. Many farms on the project suffered loss last year, it is said, because of the impossibility of irrigating at the right time and with proper rapidity, due to the fact that the ditches were in such condition that it was impossible for them to function properly.



## SMOOTHING THE PATH OF COLONIZATION<sup>1</sup>

*By Dr. John A. Wildsoe, chairman, northern division, Board of Survey and Adjustments*

THE settlement of the United States has been accomplished in comparatively recent times and under modern conditions. It should therefore be possible to apply the results of our vast colonization experience to our present-day problems. If the experience of the past had been heeded more, there would have been fewer failures in our attempts to establish colonies on our unused lands.

In the history of American colonization two ventures, conducted on a large scale, are of particular value in revealing the fundamental principles of successful colonization. The first of these is the settlement of the Great Basin and the Colorado River Basin by the pioneers of Utah. The second is the Federal venture in irrigation under the reclamation act of 1902.

The Utah colonization, which began in the valley of the Great Salt Lake in the summer of 1847, has spread, until settlements are now found in all the States of the Great Basin and the Colorado River Basin. Nearly all have met with unvarying success. Half a million prosperous people, two-thirds of whom are farmers, are carrying on the initial experiment of 1847. The United States Bureau of Reclamation has conducted its work in every Western State; more than 2,000,000 acres have been brought under water, and 200,000 people live on the lands reclaimed under the reclamation act. The history of those two developments should be helpful to those who now are engaged in colonizing lands.

*An adequate project.*—These experiences teach, first, that no enterprise in colonization can succeed unless the project is adequate to enable the farmer to meet his obligations and to live life properly in this day of high civilization. That crops can be grown is not sufficient evidence that a project is fitted for colonization.

The main question in colonization is whether the colonists, brought on the land, will remain on the land. The colonist-visitor injures a project; the colonist-settler determines its success. The test of a successful marriage is not the love of courtship days, but the love that persists after the wedding.

The experience of the Utah pioneers showed clearly that every colony placed on fertile land, with sufficient water supply, and under conditions enabling the reasonably industrious and thrifty farmer to live up to the standards of his day, was successful. When, by mis-

chance, the people settled on infertile lands, or lands with insufficient water supply, or under adverse conditions beyond control, failure resulted.

In short, the farm must pay. Doctor Work's committee of special advisers on reclamation came to the same conclusion. Their most outstanding finding was that most Federal reclamation troubles could be traced to inherent conditions that made large areas incapable of satisfying the economic, social, and religious needs of the industrious, intelligent settler. This year's Board of Survey and Adjustments has confirmed this view by actually determining, by careful land classification, that a large proportion of Federal project lands is infertile or without water supply or unproductive for other reasons, and therefore incapable of producing crops profitably.

The beginning of colonization wisdom is to make certain that the projects to which prospective colonists are invited are inherently capable of successful development. Projects which can not reward the farmer sufficiently to pay his obligation and to support his family in some comfort should be suspended from colonization efforts until such time as economic conditions change, or new knowledge permits a more profitable use of our resources. Human life is precious. The colonizer who knowingly or carelessly places men, women, and children on inadequate lands, there to waste their lives in a hopeless struggle, should be classed with the criminals, and be treated as such.

*Selection of settlers.*—The second great colonization lesson taught by experience is that the prospective colonist must be selected according to his fitness to live and labor under prevailing project conditions. It takes a man of distinct gifts to become a successful farmer. In land reclamation, the farmer is the heroic figure. Capitalist and engineer must wait for their full rewards until the farmer by his unending toil has made the vision of the engineer and the dream of the banker come true. All men may love the land; but not all men can win a living from it. The margins of agricultural profits are small; and the problems many and intricate.

Training in agriculture is not indispensable; it is desirable to have it. Many a city man has become a successful farmer; and, frequently, men with farm experience have failed as independent colonists. The test is, rather, love of

the work and the ability to manage affairs intelligently.

The people who settled the projects of the Latter-Day Saints came from many countries. The majority were Americans, but many came from England, Scandinavia, Germany, and other parts of the world. A large proportion came from industrial centers and knew little of agriculture. Nevertheless, the majority succeeded. The process of selection had secured, before they came West, only self-reliant people, able to make up their own minds and courageous for the truth as they understood it, who would join an unpopular church, leave home for distant lands and forsake accustomed comforts. The very qualities that made them able to do this were the qualities necessary in the colonies when the conquest of unfavorable conditions was the first task. The man of leadership, loving life in the open country, possessing a knack of turning to his advantage the vagaries of wind and weather, hopeful in the face of changing seasons, made money on the land, and happily raised his family there. The weaker man either eked out an existence or found a position where someone else carried the responsibility of providing for the weekly pay check.

On the Federal projects all manner of men were invited to accept the new opportunities. The special advisers on reclamation found that many project troubles could be traced to the lack of selection. Men desirous of land ownership, but temperamentally or physically unfitted for the work, came on the projects only to fail.

*Helping the farmer.*—A third lesson taught by our colonization experience is that, though settlers are fitted for agricultural life, they must be given aid. Agriculture has become a complex art; no man can know all the facts upon which it rests. The farmer needs specialized help. The Federal and State Departments of Agriculture are making such technical aid generally available, but there is much yet to be done before every farmer can obtain necessary advice in time of need. Any plan of colonization should include provision for such aid.

The settler also requires financial aid. The man who has made a fortune elsewhere is seldom induced to become a colonist of a new project. Future colonization will be made largely with young men, ambitious for independence, but with little money. In the beginning, such men will require financial aid with

<sup>1</sup> Address delivered before the Conference on Reclamation and Land Settlement, Dec. 14, 1925.



which to build their houses and to equip their farms and, later, occasional help between harvests, until their growing bank accounts make further help unnecessary.

However, whether technical or financial aid is given, we must not, as a condition, compel the farmer to follow programs prepared for him. In successful agriculture, the farmer must preserve the independence of his actions; his work can not be planned for him. He must be a free agent. Nevertheless, the giving of aid, especially financial aid, enables those in charge of colonization to offer supervision and direction which the farmer usually needs, and nearly always accepts if given in the right spirit.

In the Utah settlements, the bishop and his two counselors stood at the head of a group numbering from 500 to 1,000 souls. These men were ready to assist in the material as well as in the spiritual needs of the people. Commonly they took the lead in all community enterprises. Under the organization of the church they could call to their assistance other men and women, until all required aid became available. When the need appeared sufficiently great, the church itself would give financial assistance.

The history of the Federal reclamation projects shows without question the necessity of technical and financial aid, and that it should be given, not grudgingly but carefully, in a generous spirit. Wherever this has been done prosperity has come to the settlers.

*Community organization.*—There has come out of our settlement experiences the fourth lesson, that strong men on fertile, well watered lands and with ample aid, may fail unless they are properly organized for community life. Social are quite as important as economic needs. "Man does not live by bread alone." The colonization history of the country shows the desirability of community organization for social as well as for economic advantage.

Community organization was fundamental in the colonization procedure of the Mormon Church. A group of people, 500 to 1,000, were organized into a "ward." A strong man was called to preside over them, with the title of "bishop." He was given two men to serve as his counselors. A church or meeting house, the community gathering place, was built as soon as possible. The organized community thus established, the ward held religious meetings on Sundays and other days; at other times meetings to discuss the economic welfare of the group were held; and the people met frequently in a social capacity to enjoy the dance and other forms of recreation. Moreover, by a system of ward "teaching" or visiting, every household was

visited regularly, by appointed members of the community, and the conditions of the people reported to the bishop. In this way the needs of the members of the community were made more thoroughly known to the leaders. This method of organization is carried out thoroughly in the hundreds of Latter Day Saints settlements from Idaho to Mexico. Ordinarily the members of the ward were grouped in close settlements, the houses and barns placed on city lots, large enough for a kitchen garden and the maintenance of a cow or two; while the farms surrounded the settlements at varying distances. It was felt that the loss in time in going to the farm was more than compensated for by the benefits of compact community life. Out of such community association came a system of cooperation, unsurpassed, on a large scale, in the development of the country. It may be that cooperation, itself, the main key to national agricultural success, depends on community organization and activity. When a ward grew in membership until it was too large for three men to handle, it was promptly divided into two or more wards.

The conditions of our day, involving many new demands, may compel future colonization enterprises to give such community organization first consideration. The value of the plan has been fully demonstrated by the Latter Day Saints. The maintenance of a relatively small group of people, under a system of self-government, characteristic of the Mormon Church, serving the religious, economic and social needs of the people, has contributed greatly to make the adventure in colonization successful.

The special advisers on reclamation found that community organization on the Federal irrigation projects had similar good effects. The settlers themselves had discovered it, and in many places had set about to form organized communities, out of which had grown a cooperative understanding and many successful cooperative enterprises. There can be no question about the importance of this lesson in future colonization.

*The spiritual factor.*—Finally, a fifth lesson taught by our colonization experience is difficult to define, yet of first importance.

The success of the Mormon settlement activity, while resting upon a few simple principles, already outlined, was given life, strength, and permanence by a strong religious feeling. The things of the spirit are more important than those of the body. Spiritual forces cement the activities of mankind. Political, economic, and social forces are of secondary importance. In witness, we many recall that, in American colonization, the Church has

always been utilized by those who have been most successful. Out of the communities held together by strong religious appeals, have come the leadership which has built rural America, and preserved our American institutions.

The farmer especially must find his reward in the intangible realities. It is improbable that, in our day, the income from farming, counting the investment and labor, will be as large as in other industries. Agriculture is only in part a business; it is more a mode of living. To live in the open, to stand on one's own land; to labor independently of regulations; to match wits with nature and man; to raise one's family under conditions that breed strength of soul as well as of body—such spiritual rewards must compensate him for the lower cash income from his efforts.

It is doubtful if farming can ever be valued correctly on the basis of its money yield. There must be a spiritual purpose in every community, to make coherent and intelligible community activities. Life must be purposeful; else there will be no goal to which the community is aiming. Can we, of many creeds, as we continue our colonization, find an equivalent of the spiritual impulse? Can a community be made to feel the gain in the exchange of money for living? Perhaps, the best we can do is to see to it that the Church goes with the settler, so that he may be guided into visions of the great purposes of human life. However accomplished, it must be done. The acceptance of a coherent spiritual purpose in life is the most effective means of assisting a community to achieve success and happiness.

*Summary.*—To smooth the path of colonization, we must learn these five lessons with others that time does not permit of discussion taught by the best experience of the past:

1. That the project to be colonized, when industriously and intelligently tilled, must return an income sufficient to enable the farmer to pay his obligations and to live a life worthy of our high civilization.
2. That men placed on the farm must be fitted by temperament and health for work in the open country.
3. That the farmer must be provided, as needed, with the necessary technical and financial aid, and the proper leadership must be found to guide him.
4. That the settlers should be organized into communities for their economic, social, and religious welfare.
5. That the religious impulse is necessary to achieve high and lasting success on a colonization venture.

A plan of colonization built about these principles is fairly certain of success.

# NEED OF COMMUNITY ORGANIZATION<sup>1</sup>

By Dr. W. W. Long, Clemson College of Agriculture, South Carolina

OUR agricultural leaders of to-day are doing some thinking and much generalization concerning organized agriculture. They tell us how necessary it is for the farmers to organize, how the industries and commerce have prospered through organization. In all of which the farmers and those interested in agriculture heartily and unanimously agree.

*But what do the agricultural leaders mean by organized agriculture? What definite and specific steps do they advise that the blessings of organized agriculture may have a beginning?*

Great emphasis is placed upon cooperative marketing. Cooperative marketing is one phase of organized agriculture, and an important one, but agriculture can not be organized around one branch. There are other factors involved in organized agriculture consisting of many activities, not only of an economic character but of a productive, educational, religious, and recreational type. Also, organized agriculture develops rural leadership, which is so woefully lacking to-day in our rural civilization.

Agriculture can not be organized with the county or the State as a unit. One of the troubles with our marketing associations, for example, is their inability to keep in touch with individual members. Men show their greatest interest in the organizations in which they play a personal part in the meetings and are constantly coming in contact with the beneficial effect of their organizations.

*Therefore, it seems that agriculture, for these reasons and others, can best be organized through communities with their community centers.*

## ORGANIZATION AND OFFICERS

The first step in organizing a community is the selection of good community officers, including a president, a vice president, and a secretary-treasurer, these officials to be elected from and by the people of the community.

The president would be empowered to appoint an executive committee of such a number as may be thought best. This executive committee, in cooperation with the president, would select the necessary committees to take charge of the different community activities.

The secretary-treasurer should be carefully selected, a trained man, familiar with large affairs and possessing vision. He should be the general advisor and business manager of the community.

## COMMUNITY ACTIVITIES

In the early steps of organizing a community only such activities should be undertaken as are clearly shown to be necessary. The following activities represent a highly developed southern community:

**Community schools.**—To serve the usual purpose for the community, with special attention to agriculture, home economics, manual training, and music.

**Community library.**—In the school or the community building.

**Community bank.**—Owned and operated by the people, handling all matters of finance, and possibly conducting a building and loan association for the benefit of the community, insurance, etc.

**Community warehouse.**—For community use, including storage of cotton and other products and supplies, and as a community shipping and receiving point.

**Community sweet potato house.**—For curing, grading, and keeping sweet potatoes produced by the community.

**Community hatchery.**—For hatching poultry in quantity.

**Community abattoir.**—For slaughtering animals for community use, dressing, and packing poultry, etc.

**Community creamery.**—For assembling and converting dairy products produced by the community.

**Community cannery.**—For canning orchard and garden produce for the community in large quantities.

**Community cotton gin.**—To protect community-owned cotton from mixing with low grades, and to keep seeds pure for planting purposes.

**Community grist mill.**—To serve the community. (In connection with cotton gin.)

**Community greenhouse.**—For propagation of plants and shrubbery for civic beautification, and vegetable plants and fruit trees for the community.

**Community seed improvement.**—Land set apart for improvement of seeds of cotton, corn, etc., by selection for community use, thus making possible the use of the best varieties, and minimizing danger of mixing.

**Community power plant.**—To supply power and light for the various farms and for community enterprises.

## THE COMMUNITY BUILDING

The next step is the selection of a convenient site for the construction of a community building and the several com-

munity enterprises. This selection would be made by the president in cooperation with the executive committee.

The community building is the hub of the community. It is the magnet to attract the people to public meetings for business or pleasure, where executive matters are handled, and where social life centers. This building should be provided with an assembly hall with stage, and beneath this might be dining room, kitchen, gymnasium, baths, etc.

The offices of the executive officers should be located in the community building.

The scope of the organized rural community is not in any way affected by school districts or townships. The automobile and good roads have, in a large measure, overcome the matter of distance. *The farmer who lives several miles out could reach his community center now that we have good highways as readily and as comfortably as the city man reaches his chamber of commerce.*

## EXAMPLE OF BUSINESS AND LABOR CITED

Unfortunately, farmers as a people have never put into practice the principles of organization and cooperation employed by manufacturing and commercial industries. Were the same principles employed in our agriculture, we would easily become a very prosperous and contented people, reducing the existing burden upon producer and consumer, while at the same time automatically helping ourselves to a better and more wholesome development of mental, moral, and physical well-being.

It is strange that the Department of Agriculture and the agricultural colleges have made no serious attempt to define the meaning of "organized agriculture," nor to emphasize the necessity for its existence nor the step necessary to its establishment. In their zeal to secure information for the advancement of agriculture, they have depended entirely upon their own agencies to disseminate this information through the public press, printed matter, and to individual farmers, thus reaching at best only a small percentage of the farming class, instead of setting up the necessary machinery among the farmers themselves, where this information from the government and agricultural colleges could be received, discussed, and acted upon. A high official in the Federal Government in a recent issue of Commerce and Finance, after setting forth

<sup>1</sup> Address delivered before the Conference on Reclamation and Land Settlement, Dec 14, 1925.

certain panaceas for the agricultural ills, made the significant statement that we would have to educate the farmer, which he admitted would be a slow process, and why? Because there is no nationwide organization of farmers through which the process of education could be greatly hastened as is done with commerce and with labor.

Business men in towns and cities through their local chambers of commerce discuss problems of government, economics, and all matters affecting their interest, and record their approval or disapproval, and forward their findings to the national chamber of commerce. Labor discusses in its local unions problems affecting its interest and submits the results to its national headquarters. In this way business and labor present a solid front to the country and influence legislation and public opinion in their behalf.

*If farmers were organized through community centers they could take concerted action like business and labor and thereby could exercise even greater influence than either business or labor, for agriculture is of a more basic character and has great strength numerically.*

#### ORGANIZATION MAKES PROGRESS POSSIBLE

Economic production and marketing are imperative to reduce costs and establish better relationship and cordiality between the producer and the consumer. An organized agricultural community is a little world somewhat to itself, but with every man, woman, and child cooperating, not only producing the best possible from the individual farms for living at home, but contributing in like manner to the nonproducer of food and feed, while living under the best rural conditions with modern facilities for comfortable living. Such a community would have its own hydroelectric plant producing power and light, home water works and bath rooms, telephones, radios, good roads, and many other things to keep the people daily and hourly in close touch with the outside world, particularly its markets.

*"The standard of what we call to-day 'Civilization' is a city standard, and only through organized rural communities can we break down the differentiation between the country home and the city home, between the country woman and the city woman, between the country boy and girl and the city boy and girl." The organized rural community brings to the country home the city advantages. Nothing less will keep the intelligent, ambitious rural boys and girls in the country districts.*

#### GIVES THE FARMER A VOICE

An organization such as has been outlined, must, as stated, be fitted to the individual community, and must have the vision and inspiration and willingness necessary to undertake and carry on to conclusion whatever task is assumed. The organization can be no bigger and better than the people who compose it.

Rural community organizations could be federated in the various counties, and representatives of county federations could perfect a State organization. With the organization of this character in each State, State and national problems could be thoroughly discussed and definitely acted upon by the individual members of the community organization. In this way each individual farmer could have a voice and play a part in determining all economical problems that affect his interest.

#### Government land settlement in foreign countries

Countries	Rate of interest	Time given to pay for land or for repaying loan
	Per cent	Years
Denmark.....	3 to 4.....	65
Italy.....	2.5.....	50
Holland.....	4.7.....	
Norway.....	3.5 to buy land and 4 to owners.	
Hungary.....	4.....	50
Austria.....	4 to 4.5.....	54½
Russia.....	4.5 principal and interest.	55½
Germany.....	3.5 to 4.....	56½
France.....	4 to 4.5.....	75
England.....	4.....	50
Ireland.....	3.5.....	68
Belgium.....	4.5.....	30
Switzerland.....	4.5.....	57
New Zealand.....	4.....	36½
Victoria, Australia.....	4.5.....	36½
New South Wales.....	3 to 5.....	30 to 40
Other Australian States.....	4 to 5.....	30 to 40
British and German South Africa.....	4.....	
Chile.....	4.....	33
Argentina.....	4.....	
British Columbia.....	1 per cent more than the interest on state bonds; 5 per cent at present.	36½

Such an ideal organization is supposed to have sprung from a small beginning gradually developing through community cooperation. A stock company, in which each farm owner would own shares seems one way of solving the financial problem and is easily understood by the average layman; another plan would be a non-stock cooperative organization of the people of the community. Money invested in such an enterprise would be constantly under the supervision of its owner and properly handled should pay dividends through the medium of better prices for things sold and proportionately low prices for things not produced at

home but purchased through community agencies. Assuredly I appreciate that there are many difficulties to overcome and a stupendous task to be accomplished before the farmers can be organized.

We are just beginning to realize that our future is likely to be determined primarily by the relation of the people to the land. We have not yet learned what the older countries of the world already know—that keeping people on the land must be one of the main endeavors of civilized nations.

Two of the chief difficulties with which to contend in organizing communities are the continual growth of tenancy, throughout the land, and the distressing short tenure of tenants in occupying the land. This can be illustrated by Illinois, Indiana and South Carolina. Illinois with its 177,986 farm owners and 101,196 tenants and Indiana with its 137,210 farm owners and 65,587 tenants and South Carolina with its 67,000 farm owners and 124,000 tenants. With this condition existing we are forced to ask the question—can we hope to build up a lasting, satisfying, rural civilization under such conditions. It is interesting to note the consideration and earnest efforts of all civilized countries other than our own to encourage and aid in home ownership. We do not seem to fully realize that a prosperous, intelligent, and contented rural population is essential to our national prosperity. The world's experience has shown that the best way to secure this is to encourage a division of all lands into small farms, each owned and operated by one family. We know the world's most important school is the home with the farm; we know this philosophy to be true, so said the late Dr. Seaman A. Knapp.

I know there are economists who look upon agriculture the same way they look upon the industries. I appreciate that they advocate corporate agriculture; that they go so far as to defend tenant farming. In the last analysis they are advocating separating the farm home from the farm. To my mind they are inseparable. Unless you propose to destroy the agency that in the early history of this country had more to do with the molding of the policy upon which this democracy is founded than any other influence. I emphasize the farm home. The stabilizing influence today throughout the world is the home-owning rural farmer.

Dean Russell of Wisconsin has made this significant inquiry, "Have we ever had a profitable agriculture? Farming as an industry has not been consistently and steadily profitable. Here and there individual farmers have made money. Agricultural wealth is due more to in-

(Continued on page 28)

## THE VALUE OF CAREFUL SELECTION OF SETTLERS

*A personal interview with the applicant is the most effective means of determining his character, industry, experience, and capital, all of which are essential factors for success on an irrigated farm*

*By George C. Kreutzer, Director of Reclamation Economics*

**F**ARMING, like many other forms of business or occupation, requires skill and energy on the part of the individual to make it successful. There is no other business or occupation with which the home is so closely associated. The housewife must be a frugal manager and know how to utilize those farm products which should be produced on every farm to form a large portion of the food supply. The necessity for these requirements does not, however, deter rural minded people from making farming their life work because, after all, there are many advantages for people who know how to enjoy them. There is also a permanency about it made possible by ownership.

When a settler and his family have what might be termed rural sense, which is the enjoyment that comes from doing the many farm tasks timely and well, they have the first requisite for becoming successful. Sometimes this attribute is called experience, but it is more than that. One must have done the many menial farm jobs to really know whether satisfaction is felt upon their accomplishment, or whether they are felt to be mere drudgery.

It is the placing of individuals suited to an occupation and environment from which they will get the utmost satisfaction and benefit that is of paramount importance in any work of selection. Too often the inexperienced think they would like to own and operate a farm because of the independence it should give them, or because they have visions of picking fruit from their own trees, having fresh eggs, home-cured bacon and hams on their table. They can almost hear the splash of thick cream on their favorite breakfast food. It is true these are some of the joys of farm life, but the trees must be cultivated, sprayed, and pruned if they are to bear fruit; and the chickens, hogs and cow must be fed and cared for if we are to enjoy their products. Only those settlers should take farms who are suited to this occupation both by temperament and physical strength, and who have had some experience on farms, in the light of which their fitness for the undertaking can be more accurately determined. The experience thus gained will also save them from making costly mistakes. It has always been, and will continue to be, good advice to encourage the inexperienced man to first work for

the best farmer in the district so that he may determine his own fitness for the undertaking and at the same time gain valuable experience.

Farming has become more and more a capitalistic enterprise. The average, well equipped, irrigated farm has invested in it as much capital as is invested in a small country bank. One would not expect to start in the banking business with \$500 or \$1,000 in assets. The farmer who purchases raw land should have enough capital to erect a cottage and barn, buy working tools and equipment, and have enough left to live on until his fields are producing sufficient income to meet operating expenses and enable him to live comfortably. If he has not this capital he should know where it can be obtained.

The capital requirement will vary with the farm and the individual who undertakes to develop it. Some settlers have growing boys who can help them, thus saving the cost of labor. Others will be able to work out with teams or as skilled laborers at times of the year when their farm needs little attention. The only safe course to follow is to work out with the applicant for a farm a financial and agricultural program covering the period of development to determine what expenditures will be necessary and to estimate conservatively for the same period, the returns from crops.

Between those intrusted with the high privilege and duty of selecting settlers, and the prospective settler, himself, there should be no difficulty in arriving at the estimated cost of a house, barn, and other outbuildings, domestic water supply, fences, clearing, horses, cows, pigs, chickens, farm implements, seeds, and trees which must go into the capital investment. The operating expenses can also be estimated, such as taxes, labor, interest on borrowed money, harvesting and threshing, insurance, water charges, repairs, and living expenses. The income from crops to be grown can likewise be estimated on the basis of reasonable yields at what are known to be the usual selling prices. It is surprising how few settlers have such a program in mind when they acquire land. Although such a program may not be precisely accurate, it is, nevertheless, an excellent guide for future operations and causes the settler to allocate his

## NEED OF COMMUNITY ORGANIZATION

(Continued from page 27)

creased land values than to profits actually accumulated from products of the soil. I do not believe that agriculture can ever be made as profitable as the industries for several reasons—the inability to organize the farmers, the inability to control the elements, the invasion of insects, pests and the plant diseases, continued operation of farms during times of depression. Therefore, I think we should hold out and emphasize that agriculture offers those things which can not be obtained through commerce and the industries." In the language of Dean Davenport—"I believe we are to have a new agriculture if not indeed a new civilization."

Yes, we are to have a new agriculture. Shall it be better or worse than the one our pioneer fathers wrought? That is for us to say. For what this new agriculture shall be like and what shall be the character of the civilization of which it will be a part will depend very much

indeed upon the vision possessed by our leaders now and in the immediate future. It will depend also upon the degree of understanding and of cooperation which can be maintained between thinking citizens who must take the lead and our educational institutions which are the public agencies for investigating the many difficult problems continually arising in a rapidly developing civilization. The great question before us is, Shall the agriculture of this great country drift into its new development, accepting what the accidental fates deal out, or shall we by taking thought control and direct this development to some definite ends? By taking thought early and constantly the citizens can make this development almost what they will. What we shall be later on will be the result, not of revolution, but of evolution from what we now are, to what we then shall be. The future of our agriculture is in our own hands and there is no limit to what may be achieved.



limited capital judiciously, thus directing his expenditures into productive channels. The boards which are now to pass on the qualifications of settlers will, at the same time, give to the applicants a valuable service based on the best known local practices of developing and operating an irrigated farm.

The industry, character, experience, and capital which settlers possess all are factors entering into their success as farmers. If a settler lacks even one of these essentials he is almost foredoomed to failure. Often local communities point out that certain of their farmer citizens had no capital when they came. They can also show those who had neither capital nor experience and still made a success of farming. One such case was a young foreigner who was employed on a dragline machine at \$6 a day and who then worked an additional eight hours a day developing his farm. It is now a going concern. He was not an average good settler; he was a superman. The average person has not the physical strength or endurance to do in one day what is normally accomplished in two days.

That kind can be pointed to with pride in every farming community, but there was still a greater number whose meager qualifications caused their failure and who left behind them tar paper shacks and brush barns as mute monuments of years of deprivation and unsuccessful toil, under a plan providing for the selection of all of which could have been averted settlers.

The reclamation law as now amended by subsection C, section 4 of the act of December 5, 1924, provides for the selection of settlers in accordance with certain desirable qualifications. Local boards have been appointed to act on a number



Wheat in shock on the Carlsbad project, New Mexico

of the projects to carry this new policy into effect.

These boards are composed of men of broad practical experience in the problems surrounding irrigation farming. They should be effective because the matter of selecting settlers is more a practical problem than a technical one. They will be of most value if they will sit in with the applicants and with pencil and paper determine just how each applicant can best spend his capital to develop the farm under consideration. This leads to a thorough discussion of the financial problem in each case, to the end that the board will know if the applicant has a good chance of succeeding; and, on the

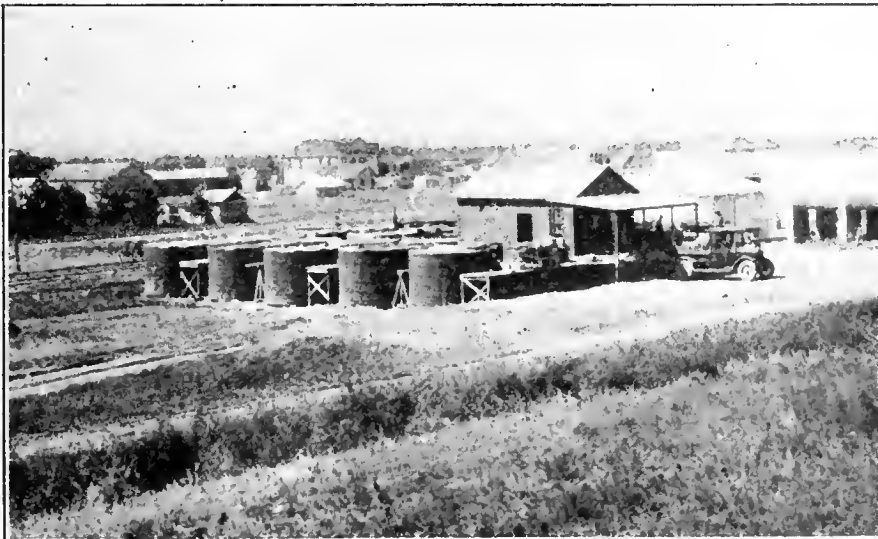
other hand, the applicant will have a full appreciation of what confronts him. It is no more or less than reaching a common conclusion of what is needed to develop a farm and how best to accomplish it.

A personal interview with the applicant is the most effective means of determining his character, industry, experience, and capital. Correspondence with bankers or other references the applicant may give will enlighten the boards in this respect. Bankers consider these human characteristics and know the value of them when making loans, and somewhat similar practice will prove of great value to the boards.

An applicant for a farm should be encouraged to bring his wife, if he has one, to inspect the farm and confer with the board, as her contentment and happiness in the new undertaking will have much to do with the applicant's ultimate success. These boards will have an opportunity to be of great assistance to the new settlers who are to come, and also they can prevent, to a large extent, duplication of some of the unfortunate experiences of the past.

At the end of December the Guernsey Dam, North Platte project, was 32 per cent completed.

A recent fire at the Spanish Fork sugar factory, Strawberry Valley project, destroyed the sugar warehouse containing 123,000 100-pound sacks of sugar, seriously damaging the contents.



Pickle salting station in Nisland, Belle Fourche project, South Dakota. Cucumbers yielded returns on this project in 1925 as high as \$400 per acre.



## ECONOMIC REPORT ON AN IRRIGATION PROJECT

*The compilation of a report on the economic feasibility of a proposed project will be helped materially by following a diagrammatic outline of factors to be considered—Such an outline is suggested here*

*By Oro McDermith, consulting engineer, Kittitas irrigation district, Washington*

IT is obvious that the economic success of an irrigation project depends on the success of the average individual farmer or settler who secures the benefits from the construction of the irrigation system. The economic success of the individual farmer in turn depends on whether he makes a profit by his operations. That is, the average annual gross income over a reasonable period of years must exceed the average gross expenditures necessary in carrying on such operations.

In making an estimate of the feasibility or probable opportunity it is necessary to consider items of gross income and cost of operations in the average individual case in considerable detail. The more detailed the estimate usually the less chance of error will be encountered. In the making of such an estimate it is very convenient to have the outline in diagrammatic form, working from the result desired down through the various component items which produce such result and having each item capable of being further subdivided to its furthest detail.

The amount of the "Annual gross income" will depend primarily on the volume of production and the prices secured. Estimates of crop prices, costs and conditions should be based on data obtained from similar enterprises as to past performance and corrected for local conditions and possible future influences. Such estimates should be made with clear judgment and consideration of future conditions. For instance, on the Kittitas division of the Yakima project the primary established crops are alfalfa and grain, which, combined with dairying, offer a firm foundation for an estimate of the character of crops which probably will be grown with the added water supply. Yet there are areas on this division which, on account of air, drainage, location, and soils, undoubtedly will be devoted to commercial orchards and other high-priced crops if future prices for these crops justify the investment. Influences of this character should be carefully considered in the economic estimate.

As the income from farm operations becomes available to the farmer largely at the end of the crop season we should consider first the detail of "The annual cost of operations" and following this, "The annual gross income."

**Cost of land and water supply.**—The primary investment of a settler on an irrigated farm unit is in the land and the

water supply necessary to irrigate such land. Usually the largest investment is in the water supply. This investment may be made all in one year or, as is usually the case, may be extended over a long period of years. Numerous methods of financing such investment are employed and the method proposed should be carefully analyzed in order to determine its effect on the annual cost for the period covered by the economic estimate.

The cost of the land should include the initial outlay for raw, uncultivated land plus the expense necessary to put such and into condition for the production of crops.

The raw land value is for the land in its natural state and consists principally in the value for grazing purposes. This should in most cases be but a nominal figure. After the land is smoothed for the first seed bed it is considered that subsequent operations will be included under the subdivision "Cost of producing crops."

The items under the "Cost of land," are capable of further subdivisions according to character and other conditions. For instance, the item of "Clearing" generally depends on the character of work to be performed and can be subdivided as shown in the diagram. Each of these items is capable of further subdivision if required.

The "Cost of water supply" is an added investment to the "Cost of land" to make the combination productive by the labor of the farmer. It should include all costs which are for the purpose of insuring the permanency of the water supply.

Each of these items is likewise capable of extension as in the item of "Preliminary cost" as applied to irrigation districts which should include the expense necessary to bring the project to the point of construction of the irrigation system. This is an investment to make the land more valuable.

The item "Water purchase cost" in the diagram would be the purchase price of a given quantity of water. The item "Other water rights" includes supplemental supplies of some value owned or acquired in addition to but separate from the main supply.

**Cost of improvements.**—The cost of improvements should include all expenditures of the capital investment which increase the value of the farm and make it more habitable.

Further subdivision of the item "Cost of buildings" is obvious.

For convenience the "Cost of general improvements" may be further subdivided, as indicated.

**Cost of equipment.**—The cost of equipment includes the yearly amount expended for tools, harness, and other items necessary to enable the farmer to carry on his operations efficiently. The grouping of these items is made thus on account of the common factor of relatively large depreciation.

**Cost of livestock.**—The yearly cost of livestock will vary greatly. As a general proposition most of the livestock will be raised on the farm, the offspring of progenitors purchased during the first few years of operation. Other cases may occur where the purchase of livestock is relatively large each year, especially where stock is bought annually for the purpose of feeding and fattening. Further subdivision of this item is obvious.

**Cost of producing crops.**—The cost of producing crops is one of the largest items of the annual cost on the irrigated farm. There are many methods for estimating this cost, depending on the grouping of the component factors. The further subdivision shown is illustrative of but one combination. The items as shown in the diagram consist of the principal operations and are capable of much more detailed subdivision.

**Other current operation costs.**—Under this heading will be feed purchased for stock, insurance on crops and livestock, water, operation and maintenance charges, and miscellaneous (itemized).

**Personal expense.**—In the farming business unlike other business enterprises the home and living expenses are considered as an integral part of the operations. These may be subdivided as indicated.

**Fixed charges.**—Under fixed charges we include: Insurance on buildings, interest charges, amortization, and general and personal taxes.

**Miscellaneous.**—Under this heading place any item which can not be placed under the above subdivisions. Any item under this heading should be accompanied with an explanation.

Annual gross income includes all receipts or values which may be received on account of any farm operation, and may be subdivided as indicated.

The completed diagram summarizes the subdivisions clearly so as to avoid duplication and the omission of important items.

*Economic report of an irrigation project*

Annual cost of operations		
1. Land and water supply.....	A. Land.....	Raw land value.
		Clearing land..... <div>(Sagebrush. Willows and cottonwoods. Cut-over lands. Forest underbrush. Timber.</div>
	B. Water supply.....	Leveling. Plowing. Smoothing.
		Preliminary cost..... <div>(Investigation. Organization. Promotion.</div>
2. Improvements.....	A. Buildings.....	Dwelling. Barn. Silo. Miscellaneous buildings.
	B. General improvements.....	Fences and gates. Irrigation system. Domestic water supply. Sewage disposal. Roads and walks. Shade trees and shrubbery. Depreciation.
3. Equipment.....	A. Hauling equipment.....	Automobiles. Trucks. Wagons. Harness. Hayrack.
		Tractors.
	B. Farming equipment.....	Plows..... <div>(Walking. Sulky. Ditching. Two-way. Gang.</div>
		Harrows. Mowers. Rakes. Drill. Stacker. Binder. Manure spreader. Corrugator. Cultivator. Potato planter. Potato digger. Other farming equipment.
	C. Special equipment.....	Scrapers..... <div>(Fresno. Slip. Buck. Mormon.</div>
		Small tools, etc. Blacksmith tools. Dairy equipment. Poultry equipment. Apiary equipment. Spraying equipment.
	D. Other machinery.....	Baling machinery. Threshing machinery. Winnowing machinery. Cleaning machinery. Miscellaneous.
	E. Depreciation.	
	4. Livestock.....	Horses. Cattle. Hogs. Sheep. Poultry. Bees. Other livestock. Depreciation.
		Seeds and seeding. Irrigation. Spraying. Cultivation. Thinning. Fertilizing. Harvesting. Packing. Marketing. Miscellaneous.
Feed for stock. Insurance on crops and livestock. Water, operation and maintenance charges. Repairs and blacksmith. Veterinary. Miscellaneous.		
Household expenses and living. Life insurance. Medical and dental. Recreation, church, etc. Furniture. Household equipment. Miscellaneous. Depreciation.		
5. Crop production.....		
6. Other current operation costs.		
7. Personal expenses.....		

Annual cost of operations—Continued	
8. Fixed charges.....	Insurance on buildings. Interest charge. Amortization. General and personal taxes. Construction charge. Other fixed charges.
9. Miscellaneous.....	Contingencies. Incidentals.
Total cost of operations..... \$.....	
GROSS ANNUAL INCOME	
1. Crop sales.....	Orchard products. Grains and cereals. Hay. Pasture. Cultivated crops. Garden products. Small fruits. Miscellaneous.
2. Livestock sales.....	Horses. Cattle. Hogs. Sheep. Miscellaneous.
3. Dairy products.....	Whole milk. Cream. Skim milk. Other products.
4. Poultry sales.....	Poultry. Live birds. Eggs. Miscellaneous.
5. Miscellaneous.....	Apiary products Other products.
6. Other income.....	Land sales. Land rents. Miscellaneous.
Total gross income..... \$.....	
Deduct cost of operations.....	
Net income.....	

CONTRACT SIGNED FOR  
KITITAS CONSTRUCTION

Signing of the contract with the State of Washington for the development and settlement of the Kittitas division of the Yakima project, and with the Kittitas Reclamation District for the construction of a diversion dam and lateral system to supply water to approximately 70,000 acres of land, at a maximum cost of \$9,000,000, by the Secretary of the Interior on December 19, released an appropriation of \$375,000 for the beginning of construction on the Kittitas division.

Preparatory work is being expedited. Local representatives of the bureau have been authorized to secure the necessary rights of way for canals, laterals, and other irrigation works. Other agreements being negotiated are purchases of flowage rights above the proposed diversion dam and contracts for building irrigation structures across the tracks of the Northern Pacific Railroad.

Estimates show that more than \$100,000,000 worth of corn stover and straws are burned, plowed under, allowed to rot in stacks, or in other ways wasted in the United States, annually.

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## TIETON DAM CONSTRUCTION, YAKIMA PROJECT, WASH.

*This great earth, gravel, and rock fill embankment, which was dedicated in July, 1925, by the Secretary of the Interior, furnishes a stable water supply for 70,000 acres in the Yakima Basin*

*By Willis C. Christopher, assistant engineer*

THE Tieton dam, part of the storage system for the Yakima irrigation project, is located on the Tieton River about 30 miles west of Yakima, Wash., and a few miles from the summit of the Cascade Range. It is in the Rainier National Forest and has a picturesque and scenic setting. Climbing the near-by hills, which with the dam will form the Tieton Reservoir, one may glimpse Mount Rainier, Mount Adams, and other lofty peaks of lesser renown.

The reservoir, with its capacity of 202,500 acre-feet, will be supported by a drainage area of 187 square miles of well-timbered mountainous country. The storage will furnish a stable water supply for 70,000 acres of land of high productivity in the Yakima Basin.

The Tieton dam is an earth, gravel, and rock fill embankment with a concrete core wall extending from bedrock to crest and anchored in solid rock on both abutments. The height from the deepest core wall foundation to crest is 321 feet. The total yardage in the embankment is 1,995,000 cubic yards, of which 1,570,000 cubic yards are earth and gravel and the remainder rock. The length of the dam along the crest is 905 feet and the thickness from toe to toe is 1,110 feet. The total quantity of concrete in the various parts of the structure is 43,600 cubic yards.

### THE EMBANKMENT

The main body of the embankment is of the semihydraulic fill type. Suitable material consisting of earth, gravel, and boulders was excavated by steam and electric shovels from borrow pits, loaded on dump cars, hauled to trestles located on the upper embankment slope, and dumped. Streams of water from hydraulic giants developing about 85 pounds nozzle pressure were then directed upon the dumped material. This sluicing tended to separate the smaller rocks, sand, and clay and carry them away from the dump toward the core wall, leaving the coarsest rocks on the outer slope well compacted and with the voids filled with smaller rock and gravel. The suspended material in the water was gradually deposited on a gently sloping beach extending from the dump to the core pool, in the central part of the dam, upstream from the core wall. The width of this pool was maintained slightly greater than one-third of the distance

down from the top of the dam. By the time the sluicing water reached the pool it held in suspension only the finest sand and clay. The fine sand was deposited at the outer edge of the pool and the clay toward the core wall. Thus was built up a tapering puddle core of impermeable material in front of the concrete core wall, with a thickness equal to one-third of the height from the top of the dam. The height of the water in the pool was regulated through conduits in the west abutment which were connected with the diversion tunnel. In building the part of the fill below the core wall the material was dumped and washed in the same way, but no pool was maintained against the core wall. The clay was thus carried off in the water leaving a deposit of sand against the core wall grading through gravel and rock to coarse gravel on the outer slope. This left a heavy, compact freely-draining fill on the downstream side. Clean rock excavated from the tunnel and spillway was used in building up the rock fill part of the embankment.

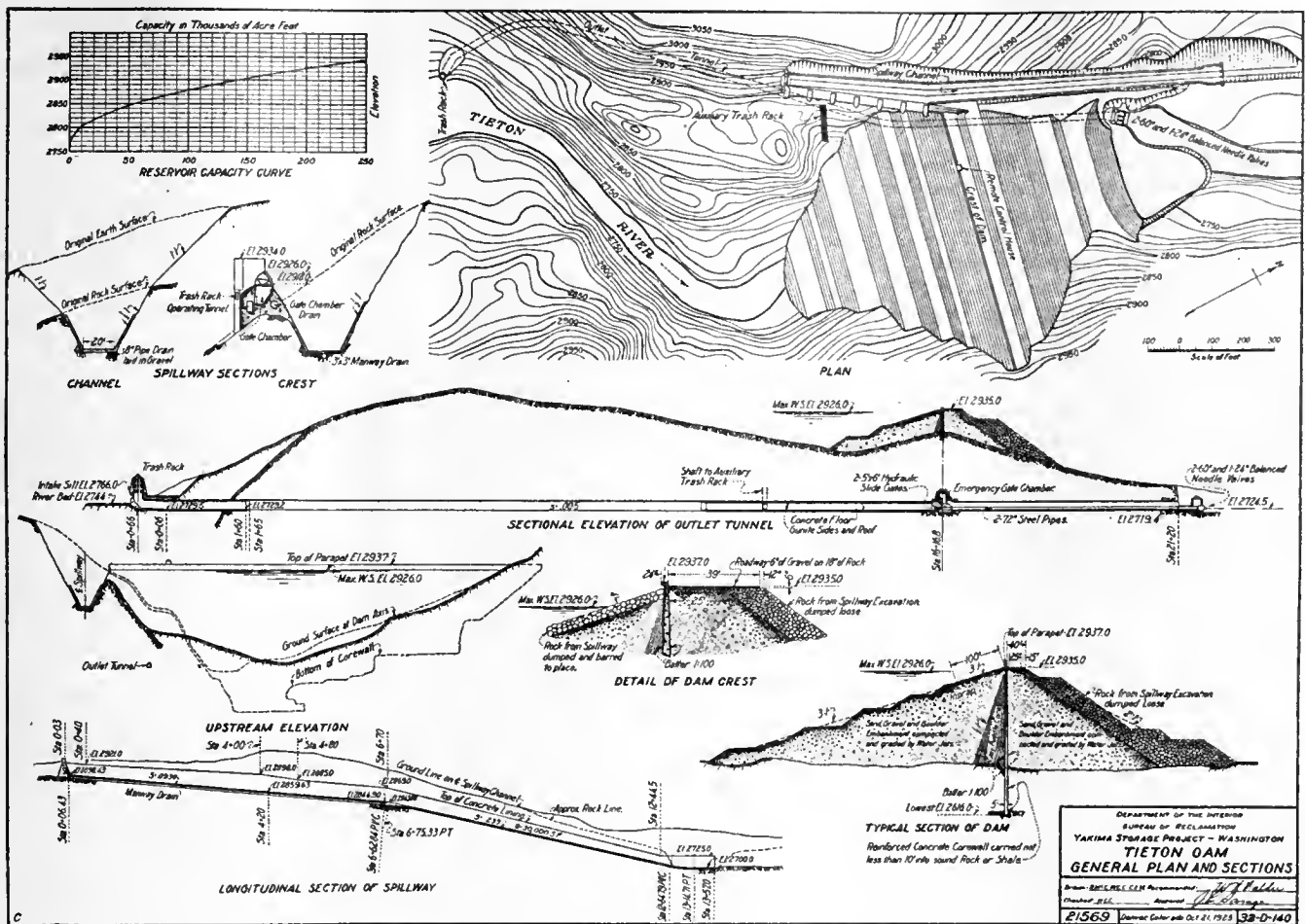
### THE FOUNDATION

In testing foundation conditions at the dam site several shafts were driven to bed rock along the line of the core wall. These showed an overburden of from 20 to 90 feet of earth on the rock with an average of about 60 feet. It was decided to excavate the cut-off trench through this overburden by mining methods rather than by open cut. Therefore the test shafts were rigged as working shafts with frames, cages, and hoists. At the bottoms of the shafts drifts were started in either or both directions along the line of the core wall, the material being mucked into cars on the skips. As soon as the drifts were opened up regular mine timber sets were put up and a track laid. Thereafter the cars were pushed to the heading, filled with muck, pushed to the cages, hauled to the top, and dumped. Side and top lagging were used wherever necessary. When the bottom drift was sufficiently far into bedrock the top lagging was taken out at some convenient point and enough material picked or barred down into waiting cars so that a set of timbers could be placed. Then this drift was extended in either or both directions. Successive drifts were opened up in a similar manner and the material trapped in cars below. Considerable water was encountered in

the lower workings, so it was necessary to backfill with concrete as soon as possible. The concrete was mixed outside, dumped into cars, lowered, and taken out on some drift from which it could be conveniently dumped to fill the lower drifts. All drifts penetrated bed rock until sound rock was encountered with a minimum allowable penetration of 10 feet. Underground concrete was plain but the concrete above ground was reinforced. The thickness of the core wall varied from 1 foot to 5 feet, both faces having a batter of 1:100. The thickness of underground concrete was 5 feet. Wooden forms were used for the wall, the panels being tied together with  $\frac{1}{2}$ -inch steel rods. The concrete was deposited in the forms in 5 foot 8 inch lifts by means of cableway buckets of 2 cubic yards capacity. A concrete mixture of 1:2 $\frac{1}{2}$ :5 was used throughout the core wall. Two 4-foot diameter shafts were built on the downstream side of the core wall to facilitate future inspection of the wall and puddle core. The completed wall contains 23,400 cubic yards of concrete.

### THE SPILLWAY

The spillway consists of a side-over-flow concrete crest nearly at a right angle with the dam and a concrete-lined channel extending to a point well below the dam. Both crest and channel are constructed in the solid rock which forms the west abutment for the dam. The spillway crest is divided into six bays—each fitted with a 65-foot by 8-foot drum gate of the Arrowrock type. The total overflow length is 390 feet. With the gates down the discharge capacity is 30,000 second-feet with an 11-foot freeboard on the dam. A reduction of this freeboard to 7 feet will increase the spillway discharge to 50,000 second-feet. The maximum recorded flood discharge of the Tieton River at this point is about 10,000 second-feet. The spillway gates weigh about 45 tons each. Each is controlled independently of the others and each one may be operated by hand. The two gates nearest the dam are provided with automatic siphonic controls. The crest foundation has been thoroughly grouted to prevent uplift. Holes for grouting were driven by both air drills and diamond drills. The total concrete placed in the spillway amounted to 15,800 cubic yards.



## TUNNEL AND OUTLET WORKS

A tunnel 22 feet wide and 19¼ feet high was the first feature completed. Upon the building of a cofferdam the entire flow of the river was diverted through this tunnel during the placing of the embankment. The outlet control works were later installed in this tunnel. Two hydraulically operated 5-foot by 6-foot slide gates were installed in the tunnel on the center line of the core wall. These gates are provided with two independent sets of controls, one in a chamber immediately above the gates and another on the top of the dam. From these gates two 72-inch electric-welded steel pipes lead to two 60-inch balanced needle valves and one 24-inch balanced needle valve in a house at the mouth of the tunnel. These valves have a combined discharge capacity of 1,700 second-feet and will be used to control the flow for the irrigation demand. A vertical trash rack is provided at the upper end of the tunnel and an auxiliary trash rack with an independent intake leading through a shaft to the tunnel is provided just below the spillway crest. The upper 220 feet of the tunnel is lined, as is also the 500 feet immediately above the emer-

gency gates. The tunnel and outlet works contain 4,150 cubic yards of concrete.

An excellent camp was maintained, well built, sanitary, and with an excellent

## WOMEN VOLUNTEERS WANTED FOR ERA

The Secretary or some other officer of each and every organization of women on our projects is requested to take her pen or typewriter in hand and write to Miss M. A. Schnurr, secretary of the Commissioner of Reclamation, and associate editor of the *NEW RECLAMATION ERA*, and outline her views as to how the *ERA* may best serve the interests of our project women. The same invitation is extended to every woman not connected with a women's organization.

The *ERA* wishes to be of service to every one on the projects—men, women, boys, and girls. Just now the call is for women volunteers; without whose cooperation this proposed feature of the *ERA* can not be a complete success.

Write to-day!

supply of mountain water. The maximum number of men employed at any one time was 570. A 1,000-kilowatt hydroelectric plant furnished light and power for the job and the camp. The principal plants operated by electricity were the compressor, electric shovel, sluicing plants, cableways, gravel plant, and to a large extent the mess. The hauling of supplies and equipment from the nearest railroad station, 26 miles distant, was done by trucks under contract.

The cost of Tieton Dam is \$4,373,600, which is \$240,000 less than the estimated cost in 1921. Had the quantities remained the same as those used in the original estimate, a saving of more than \$400,000 would have been effected. In order to keep the spillway channel in solid rock, a change of line was necessary, which increased the excavation for that feature approximately 90 per cent.

The principal unit costs are: Tunnel excavation, class 3, \$7.02 per cubic yard; spillway excavation, class 2, 56 cents per cubic yard; spillway excavation, class 3, \$1.68 per cubic yard; embankment, earth, 54 cents per cubic yard; embankment, rock, 73 cents per cubic yard; concrete, plain, \$12.60 per cubic yard; concrete, reinforced, \$17.39 per cubic yard; spillway lining, \$21 per cubic yard.

## CLOSER SETTLEMENT IN AUSTRALIA

ONE of the earliest of the irrigated closer settlements established in Victoria, Australia, was located at Bamawm when Dr. Elwood Mead, now Commissioner of the Bureau of Reclamation, was chairman of the State Rivers and Water Supply Commission of Victoria.

The land for this closer settlement was purchased at prices ranging from \$35 to \$50 an acre. Settlers were required to have not less than \$1,500 capital and satisfactory farming experience. The land was sold to these settlers on 31½ years' time, with interest at 4½ per cent, and they were given advances for help in its development up to \$2,500, to be repaid in 20 years with interest at 5 per cent.

The settlement was started in 1910. In the 1925 report of the State Rivers and Water Supply Commission of Victoria, there is a review of its progress. It is printed in the ERA as showing the operation of aided and directed settlement in other countries.

"The development of irrigation in all parts of the world is one of slow but sure growth, and, although in some countries there has been some slight retrogression on account of the postwar slump in markets for agricultural produce, it is gratifying to note that in this country irrigation development has continued to make satisfactory progress.

### ITALIAN RECLAMATION MAY PROVE INFEASIBLE

A recent press dispatch states that land reclamation work, with which Italy has given employment to hundreds of war veterans, is beginning to approach completion. In all, 80,000 acres have been set aside for this purpose, some of the land being the gift of the King to the men who should accomplish its reclamation. More than \$3,000,000 has been granted for the work. Hitherto some of the districts have been malarious and virtually uninhabitable.

Although Italy has vast tracts of such lands which are not only useless but positively dangerous to health, it is still disputed whether it is economically feasible to reclaim them. In other words, it is believed by some that the produce of the reclaimed lands will not be sufficient to pay off the amounts of money expended on them.

"A striking example of this is noticeable in the Bamawm Closer Settlement Estate in the Rochester district. This estate, which comprises an area of 13,400 acres, was, prior to its purchase for closer settlement under irrigation, used for cereal growing and sheep raising; and, although considered closely settled under dry-farming conditions, supported only 21 families. In 1910 this Bamawm area was purchased by the Government and in 1912 subdivided into 180 blocks of an average area of 70 acres. The size of the individual holdings varies with the quality of the soil and ranges from a few acres for workmen's holdings to 200 acres for mixed farming, where the soil is not of the best quality. Almost immediately after settlement, and before the settlers had time to establish themselves, they had to face the dry visitation of 1914-15, which caused them heavy losses. The period 1915-1919 had then to be spent by the settlers in consolidating their position by effecting improvements and raising the quality of their herds. During this period it was necessary for the commission to assist the settlers by advances while at the same time, the arrears of instalments due increased, reaching a maximum of \$125,000 in 1919. As a set-off, however, the settlers' improvements during this period increased from \$213,210 in 1916 to \$358,000 in 1919, and since then there has been a steady decrease in the amount owing, while further improvements have been made, making a total value of permanent improvements of \$702,060. In addition the settlers' stock and implements bring the total value of their assets to over \$1,375,000. The value of the land has likewise increased by at

### EDUCATIONAL MEETING OF GREAT IMPORTANCE

The most important educational gathering of the year will be held in Washington, D. C., February 22 to 25, under the auspices of the department of superintendence of the National Educational Association. An educational exhibit, in which the Bureau of Reclamation will be represented, will be placed in the Interior Department Building. One or two sections of the department of superintendence will hold their meetings in the Interior auditorium. About 15,000 delegates from all sections of the country are expected to attend the conference.

least a further amount of \$500,000. Thus to-day the settlement is in a very satisfactory condition as the subjoined figures show.

"The stages in the progress made by the district from 1910, when it was used mainly for cereal growing and supported 21 families and now when it supports 176 families are shown by taking the progress at two different periods, 1916 and 1925, thus:

	1916	1925
Land—Purchase money due by settlers.....	\$637,500	\$529,800
Advances—Repayments due by settlers.....	\$147,500	\$37,840
Value of improvements, stock, and implements.....	\$363,790	\$1,375,000
Population.....	501	1,182
Citrus groves.....acres..	396	816
Deciduous orchards.....acres..	376	624
Lucerne, cereal, and fodder crops.....acres..	6,757	11,020
Cattle.....	769	2,073
Horses.....	550	670
Sheep.....	3,274	6,950
Pigs.....	1,542	8,982
Poultry.....	3,167	24,000

"It will thus be seen that, during the past 10 years, there has been a most marked increase in the value of assets with a corresponding decrease in amounts owing, and this improvement should be even more pronounced from this on, as settlers begin to get the full benefit of developed orchards and increasing number of stock."

A large number of sheep are being fed in Boise Valley. The large corn crop created an active demand for hogs and cattle to fatten.

### FARM OUTLOOK REPORT FOR 1926 NOW READY

The fourth annual report on the economic outlook for leading crops and livestock produced in the United States will be issued by the Department of Agriculture on February 8.

This report is intended to help farmers plan crop and livestock production to meet probable consumptive demands in the United States and abroad. It deals with the outlook for cotton, bread grains, corn and other feed crops, livestock production, and commodities such as tobacco, flax, white potatoes, sweet potatoes, and other leading fruits and vegetables. The report includes also a review of the agricultural credit situation, and outlines the situation relative to major expenses of agricultural production.



## ORGANIZATION ACTIVITIES AND PROJECT VISITORS

**R. F. WALTER**, chief engineer, and **George C. Kreutzer**, director of reclamation economics, spent several weeks in the Washington office in connection with administrative policies and proposed legislation, returning to Denver about the middle of January. Mr. Kreutzer stopped off on the North Platte project on his return.

**Hugh W. Colton**, land appraisal and statistical clerk, was appointed recently in the Washington office and assigned to the division or settlement and economic operations.

**Senator Means**, of Colorado, was a recent visitor on the Grand Valley project, where he inspected the project lands and conferred with the directors of the water users' association.

**E. U. Combs**, general field manager of the Sacramento Valley Cotton Gin Co. was on the Orland project recently in connection with the experimental growth of cotton on the project.

**George S. Moore**, clerk and fiscal agent on the Milk River project, has resigned, effective December 31.

Headquarters for the Spanish Springs division of the Newlands project have been established at Fernley, Nev., under the direction of Engineer **A. W. Walker**. Junior Engineer **L. F. Canterbury** and Chief of Field Party **J. C. Coniff**, who had previously been employed on the Newlands project, have been assigned to the new work.

Superintendent **Richardson**, of the Newlands project, and District Counsel **Coffey** conferred recently with United States Attorney **Springmeyer** in Reno on the Carson River water-right adjudication suit, and left Fallon in company with Mr. **Springmeyer** on January 17 for a conference with the Attorney General in Washington on the suit.

**George H. Harris**, former superintendent of the King Hill project, left the project on January 1 for Phoenix, Ariz., by auto, after turning over to the King Hill irrigation district the operation and maintenance of the project.

### CONSERVATION

*It is the policy of the Interior Department to encourage and even urge the impounding of the water on the upper reaches of all streams in the arid and semiarid regions of the United States. The precipitation of moisture in any region is fixed within approximate limits and can not be increased. Water must be used more than once to secure the greatest benefit from a given supply.*

*The results of scientific meteorological observations and stream measurements demonstrate beyond argument that except for consumptive use in plant growth and by evaporation, no water is lost when used for irrigation and power development, but it later returns to the stream and may be repeatedly used before the final return flow reaches the stream at its outlet, but water first applied far down the stream is forever lost to use above the point of diversion. High diversions automatically simplify administration of water rights, which in the past have led to so many dissensions between neighbors, court-adjudication of rights, and litigations between States; interminable, costly, and delaying development of the West.*

*If diverted first to the lower areas in the watershed its reuse will be curtailed and often lost forever for beneficial purposes. Irrigation in the upper reaches of a stream acts as ground storage, equates the seasonal run-off of the stream below, and can be again and again diverted or stored for irrigation or power purposes as far down as opportunities exist.*

*The department would urge all interests in the upper reaches of such streams to take advantage of topographic conditions, secure their rights, and make early appropriations for storage and diversion for irrigation or power development; to profit by the opportunities of the pioneer in time and place for their own advantage and ultimate benefit to those on the stream below them. While there is no Federal embargo on the use of streams in reclamation, the absence of agreements between States interested operates as an economic embargo and prevents the preparation of adequate plans for development.*

**C. C. Elder**, assistant engineer, who has been at Fort Sumner, N. Mex., for the past six months engaged on the Pecos River secondary investigations, returned recently to the Denver office.

**Andrew Weiss**, assistant director of reclamation economics, has returned to the Denver office after an extended field trip which was devoted to soil and economic surveys on the secondary **Umatilla Rapids** and **Okanogan-Methow** projects.

**B. E. Hayden**, industrial agent, has returned to the Denver office after completing an appraisal and land classification of the **Vale** project and the major portion of the work on the **Owyhee** project.

**Julian Hinds**, assistant designing engineer, and **William M. Green**, engineer, recently visited the site of the proposed **Hyrum Dam** near **Logan, Utah**, and discussed plans for foundation explorations for which funds have been provided by private interests in the **Cache Valley**.

**Prof. Maynard**, authority on sheep feeding from the **Colorado School of Agriculture**; **L. M. Paxton**, traffic manager of the **Union Stock Yards** at **Denver**; and **Mr. Mahon**, of the **Denver & Rio Grande Railroad**, visited the **Uncompahgre** project recently, at which time a lamb-feeding tour was conducted under the direction of the county agents of **Delta** and **Montrose Counties**.

The clerical force on the **Rio Grande** project has been reduced by the resignation of **Mrs. R. A. Moore**, clerk. The duties formerly performed by **Mrs. Moore** are being handled temporarily by Junior Clerk **Helen L. Fahrencamp**.

**T. R. Smith**, junior engineer, has been transferred from the **Klamath** project to **American Falls**.

**H. C. Melaas**, former fiscal agent on the **Klamath** project, has left the Government service to accept a position as purchasing agent for the **Ewauna Box Co.** of **Klamath Falls**. **J. C. Avery** has been designated as fiscal agent.

**R. S. Hopkins**, former instrumentman on the **Klamath** project, has left to accept a position as secretary-manager of the **Langell Valley** irrigation district.



High Line Canal on the Strawberry Valley project, Utah

## FARM ECONOMIC ASSOCIATION MEETS

The sixteenth annual meeting of the American Farm Economic Association, held in New York City on December 28-30, 1925, was characterized by the usual full attendance and by the merit and quality of material discussed.

The interest in land and agricultural economics evidenced by this meeting of men from distant places and by speaking, writing, and discussion is the outward and visible sign of an inward determination, of which examples are coming every day to hand, to survey agriculture, and if it is found to be suffering from an illness, then to prescribe an adequate remedy.

Several participants expressed the opinion that land and agricultural economics neither would nor could have been treated with equal knowledge nor from such diverse angles at any previous time.

This confidence in the sincerity and ability of economists is an abundant assurance that we will soon stand in respect to knowledge of land and agricultural economics upon an equal footing with any country.

We wish the American Farm Economics Association its full measure of usefulness and success.

Early lambs from the Belle Fourche project have all been marketed, and prices at Omaha were about \$15 per hundred-weight.

## COTTON CULTURE IN SALT RIVER VALLEY

Culture of Pima and Upland cotton in Arizona is the subject of Farmers' Bulletin No. 1432, the object of which is to describe cultural methods which have proved successful in the Salt River Valley and adjacent districts, including the preparation of the land, planting, irrigation, and cultivation of the crop.

## SUGAR-BEET PRICE IS GOOD NEWS TO GROWERS

The recent announcement by the Great Western Sugar Co. of a minimum contract price of \$8.50 per ton for the 1926 beet crop is of great importance and significance to the Huntley project and all beet-growing communities. Under the prevailing prices the farmer on the Huntley project would not have grown beets in 1926, because, with the exception of the very best land, they could not realize expenses. Beets are a fundamental crop in irrigated districts in this part of Montana, and if it became impossible to grow them, it apparently would have meant more difficulties for the farmers on the Huntley project. The announcement should mean a prosperous season in 1926.

## PUBLIC LAND SALES AID RECLAMATION FUND

The reclamation fund was increased \$180,217.32 through receipts from the sale of public lands, including fees and commissions covering the third quarter of 1925. A list of the States with proceeds from the sale of public lands credited to the reclamation fund follows:

Arizona.....	\$6,430.67	North Dakota...	\$531.50
California.....	16,915.01	Oklahoma.....	286.81
Colorado.....	15,350.15	Oregon.....	7,531.48
Idaho.....	10,649.96	South Dakota...	2,660.71
Montana.....	17,881.45	Utah.....	47,157.26
Nebraska.....	590.09	Washington.....	23,113.75
Nevada.....	3,337.09	Wyoming.....	18,161.41
New Mexico...	9,669.98		



The evolution of the school house on an irrigated project

# NEW RECLAMATION ERA

VOL. 17

MARCH, 1926

NO. 3



THE VALUE OF APPLES GROWN ON THE FEDERAL IRRIGATION PROJECTS LAST YEAR AMOUNTED TO MORE THAN \$5,500,000, WITH AN AVERAGE PER ACRE VALUE OF \$238.81

## Colorado River Development

*I*N the case of the Boulder Canyon reservoir, there is need for immediate action to safeguard the Imperial Valley and other lands in Arizona and California from the always impending disaster of flood. There is need for an additional water supply for the present irrigated acreage there during years of low run-off and the incidental opportunity of adding largely to that irrigated acreage from Government lands now desert. There is a prospective shortage of industrial power in the Southwest and an assurance that this market will absorb all the power that can be generated at Boulder Canyon at a price that will insure the return of the entire investment with interest within our present lifetime. Under the proposed plan of the Secretary of the Interior, the National Treasury will not be required to advance any funds directly, the enterprise being financed by a Governmental bond issue, and the United States undertaking the development as an assurance of even-handed justice to all the more or less conflicting interests involved. The proposed development thus presents a unique combination of the elements of urgency, immediate utilization of benefits, and commercial and economic feasibility together with similar involvement of national and international interests.

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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No. 3

## HIGH LIGHTS IN A REVIEW OF THE MONTH

**S**ALE of the Williston project, North Dakota, to W. R. Davidson, of Williston, for \$50,000, has been authorized by the Secretary of the Interior, after the high bidder at a previous sale had refused to execute his contract and forfeited \$7,700 to the reclamation fund. Terms of the new sale provide in addition that a rental of 10 cents be paid for each ton of coal mined at the Government-owned project coal mine.

**C**OTTON picking on the Yuma project has been completed and the yield for 1925 will amount to about 26,500 bales. During January 76 cars of cotton, valued at \$350,000, and 47 cars of cottonseed, valued at \$42,300, were shipped from the project.

**T**HE local Orange Growers' Association on the Orland project, operating independently of any outside marketing organization, packed and marketed last season's crop with gratifying results. Packing costs were reduced from \$1 per box to 65 cents, while the quality of the pack has been maintained at a high standard.

**A**N agreement has been reached by which Minidoka and Cassia Counties, Idaho, will share the services of County Agent J. W. Barber, of the university extension division, and John T. Montgomery, livestock specialist of the Department of Agriculture. Mr. Barber will devote his attention to crop work and Mr. Montgomery to animal husbandry, which will tend toward a simplification of agricultural aid undertakings on the Minidoka project.

**A** CONSIDERABLE number of real estate sales have been made recently on the Minidoka project. There has also been a heavy liquidation of mortgage indebtedness.

**T**HE Holly Sugar Corporation announced recently that approximately 3,000 acres on the Grand Valley project were covered by sugar-beet contracts, and that they anticipate an area at least as large as that of last year.

**T**HE new contract offered by the Holly Sugar Corporation to beet growers on the Uncompahgre project contains two changes, both of which are in the interest of the growers. The price of seed to be furnished has been reduced from 20 cents a pound to 15 cents, and the initial guaranteed payment for beets has been increased from \$4.50 a ton to \$6.

**S**OME excellent yields of sugar beets were grown in 1925 on the Milk River project. Here are some of the high yields: A. L. LaFond, 15½ tons per acre on 4 acres; Mr. Evans, near Dodson, 17 tons per acre on 8 acres; H. C. Robinson, near Malta, 21 tons per acre on 8 acres; C. C. Mains, near Malta, 28 tons per acre on 2½ acres.

**C**ONTRACTS have been made with each of the two irrigation districts on the Lower Yellowstone project authorizing the expenditure of \$7,000 for the design of a drainage system, to be included as operation and maintenance cost in 1926.

**T**WO sugar factories are under construction in the North Platte Valley, one by the Great Western Sugar Co. at Minatare and one by the Holly Sugar Corporation at Torrington. The Union Pacific Railway has recently completed a 4-mile extension from Cottier to Torrington which connects with the new factory.

**C**ONSTRUCTION of the Pilot Butte Dam embankment, Riverton project was completed on January 18.

**T**HE four sugar factories operated by the Great Western Sugar Co. on the North Platte project finished their run at the end of January, producing 2,090,000 sacks of sugar.

**T**WO companies have started commercial hatcheries in Scottsbluff, North Platte project, each having a capacity of 40,000 eggs. Several other individuals on the project have operated incubators of 1,000 to 2,500 egg capacity, but this is the first time it has been attempted on such a large scale on the project.

**T**HE directors of the bank at Fallon, Newlands project, have decided to resume the policy of shipping in dairy stock for distribution among project farmers with a view to doubling the dairy population in the valley in the near future. That the average bank deposits during 1925 were approximately \$100,000 in excess of those for 1924 is attributed chiefly to the success of the dairy industry.

**T**HE rock excavation for the spillway channel at McKay Dam, Umatilla project, has been completed, 32,200 cubic yards having been removed at a unit cost of \$2.25, compared with the estimate of 27,000 cubic yards at a unit cost of \$2.50.

**O**N the Tieton division of the Yakima project \$30,377 was collected in January. On the Sunnyside division warrants to the amount of \$96,704.77 were received from the Sunnyside Valley irrigation district. Prospects for collections during the next few months are very good.

**A**T Guernsey dam, North Platte project, work has been completed on trimming the side walls in the diversion tunnel, and on excavating the six cut-off walls in the dam abutments. The cut-off walls have been concreted to a height that makes them safe against high water.



## THE UTILIZATION OF THE COLORADO RIVER<sup>1</sup>

*Financed through a bond issue, this proposed development will not interfere with the fiscal operations of the Government, but will pay interest on all money advanced and provide a sinking fund for repayment of costs*

*By Dr. Elwood Mead, Commissioner, Bureau of Reclamation*

IN many ways the Colorado is the most interesting large river of the arid region. From the lovely morainal lakes at its headwaters in the Wind River Mountains to the sculptured cliffs of the Grand Canyon it is a river of rare scenic beauty and justly celebrated as such. It is the only one whose valleys are all arid. In them permanent settlement, if not the existence of civilized life, depends on the ability to use water in irrigation.

Six million horsepower to light cities and turn the wheels of industries can be generated by the 14,000-foot fall of its waters from the snow-clad summits of its source to the irrigated farms below sea level near its mouth. Two important cities outside of its watershed, Denver in the Rocky Mountains and Los Angeles on the Pacific coast, look to it for the water supply necessary to their future growth. Denver is now putting a tunnel through the mountains; Los Angeles has voted a \$2,000,000 bond issue to build a pipe line.

Thus far efforts to use the river have been directed to meeting urgent and immediate needs of widely separated localities. Such development will no longer answer. We have reached a time when the stream as a unit should be considered. The rights of seven States watered in part by the river should be determined and a foundation laid for their permanent protection.

<sup>1</sup> Address given in New York City, Feb. 3, 1926.

Another reason for this broader conception is that the Colorado is an international stream. Although all its water comes from this country, it flows beyond our boundary and empties into the Pacific Ocean in Mexico.

These economical and political questions press for our attention because of the plight of the people who now live under irrigation in its lower valley. At Yuma the United States has invested about \$12,000,000 in the irrigation of land on both banks of the stream. Protection of these lands from flooding has required the construction and each year involves the costly maintenance of protecting levees. The Palo Verde, farther up, is also subject to inundation, and the Imperial Valley, the largest and in many ways the most valuable irrigation district in the United States, is menaced with economic destruction by increasing dangers from flood and drought.

The work to protect these irrigated areas and provide water for the household and industrial needs of growing cities of the Southwest will make possible a great generation of electrical power. So important is this development, so urgent are these needs, that a congressional committee visited this region last year, and a bill has been introduced in Congress for the building of a dam 550 feet high, the creation of a reservoir to hold 26,000,000 acre-feet of water, and the construction of an all-American canal adequate to meet the needs of the Im-

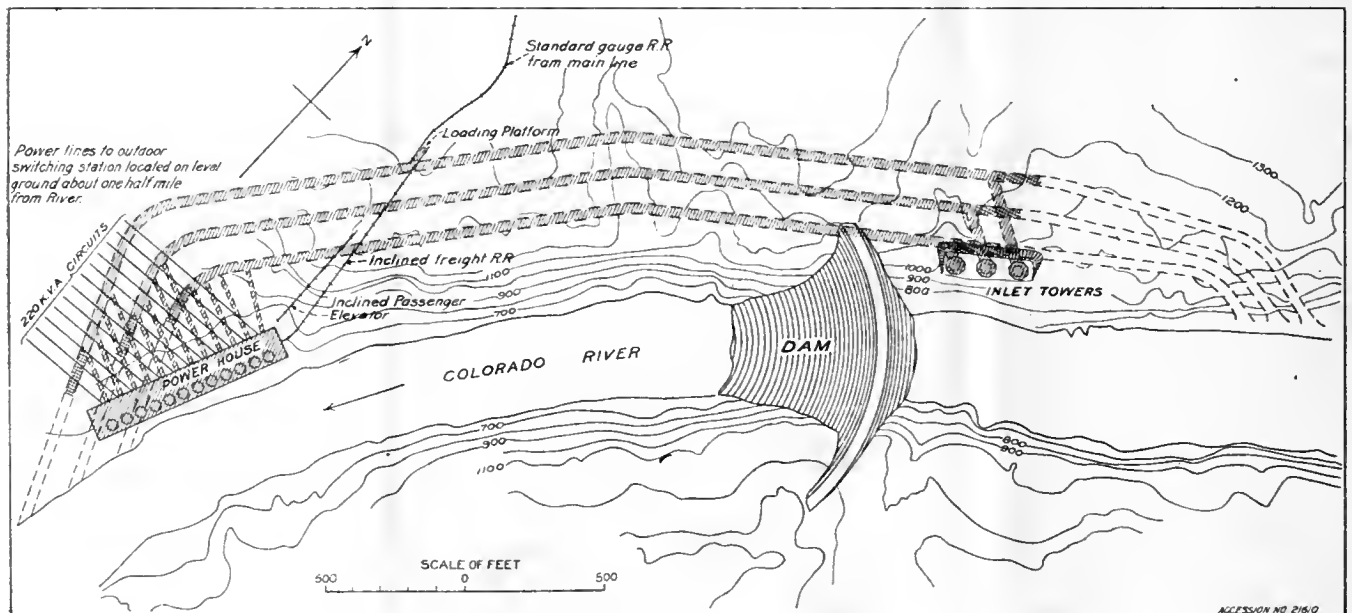
perial Valley, provide for the irrigation of half a million acres of arid but fertile desert land in Arizona and California, and to rescue the Coachella Valley from an impending water shortage due to the gradual lowering of its underground water supply.

The magnitude and cost of this undertaking make it in every respect a national enterprise, and it is desirable that the Nation should understand its engineering and economic foundation. We will begin the explanation of its problems by a statement of the needs of the Imperial Valley.

### AGRICULTURE BELOW SEA LEVEL

In the southwest corner of the United States, below sea level and 100 to 200 feet below the river which supplies water for irrigation, is the largest irrigation district in this country. The yearly value of its products is somewhere between \$40,000,000 and \$50,000,000. On its farms and in its cities some 60,000 people now live.

On its farms citrus and date-palm orchards are found alongside of barley and long-staple cotton. It shipped 28,000 carloads of fresh fruits and vegetables to outside markets last year. From that valley New York gets its earliest and best cantaloupe, and 15,000 carloads of lettuce were shipped last winter, mainly to eastern cities. The architecture of its towns, the comforts and attractions of its farm



Plan of dam and power plant, Colorado River

homes, the intense cultivation of its fields, combine to make this valley a great factor in the prosperity of the Southwest.

Three decades ago this area was a desert solitude. The summer heat which then beat down on its miles of sand and cactus desolation was so intense that travelers sought safety and comfort by making their journey across it by night. Those who saw it then had no inkling of the agricultural opulence latent in its arid but fertile soil or the grave international complications that would come with its cultivation.

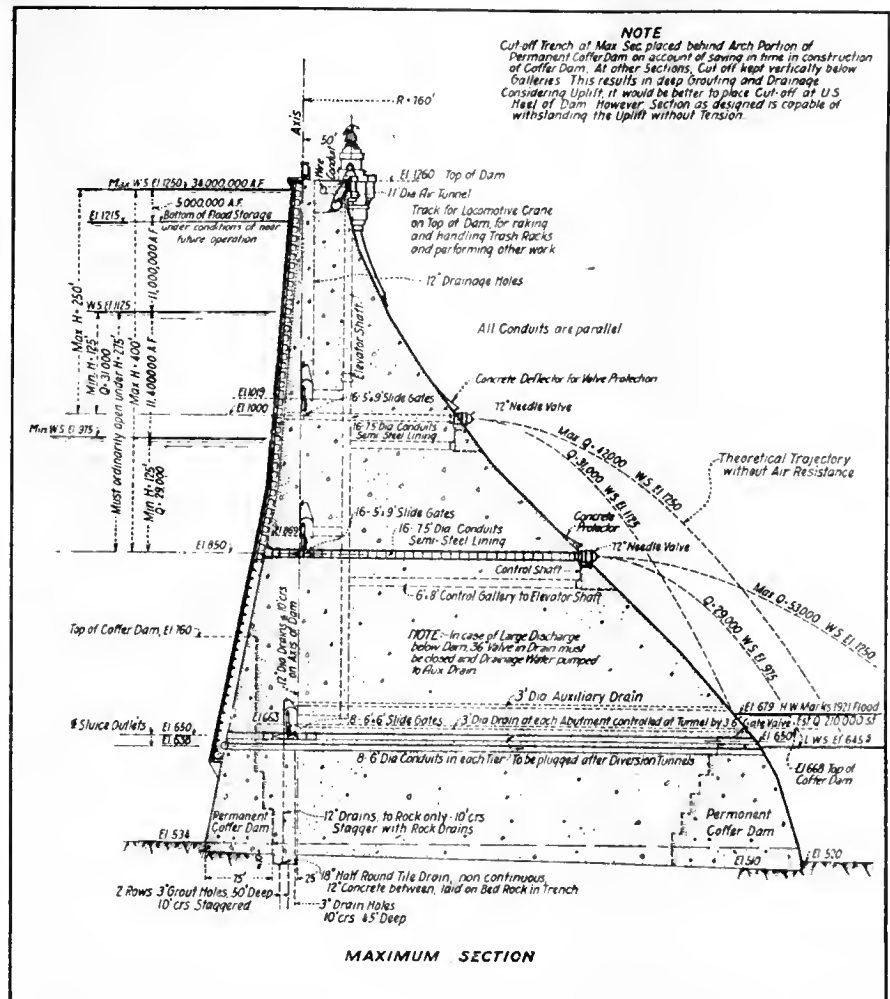
Agas earlier it had been part of the floor of the Pacific Ocean into which the Colorado River poured its tremendous burden of sand and silt, which now every year has a volume sufficient to cover 100,000 acres of land a foot deep. This built up a deltaic ridge across to the opposite margin and cut the northern part of this arm of the sea from its connection with the ocean.

After this happened the river, for a period older than Indian tradition, has discharged into what is now the Gulf of California. The inland lake on the north evaporated, leaving only a small body of intensely brackish water at the bottom of its basin. During the high water of summer the river would overflow its banks, moisten the adjacent soil, and thus nourish the dense jungle growth of trees, weeds, and vines that grew along its bank. This growth let some of the water through, but it held all the silt and thus built up a natural levee several feet high, so that only in highest floods did any water find its way through the bordering jungle growth.

About 20 years ago an engineer with vision investigated this region. He saw the sand and cactus basin on one hand and the turbid Colorado with its fringe of tropical vegetation on the other. A cut through its natural levee would enable the water to be diverted and carried around the rim of this inland bowl. Regulating gates, a main and distributing canals would convert it into a region of farms and homes, but before this could be done an international barrier had to be removed.

It so happens that this deltaic ridge is in Mexico. Also an elevated sand ridge bordering the river north of the boundary makes a canal wholly within the United States very costly. To build a cheap canal this ridge must be avoided, and this could be done only by going south of it through Mexico.

The canal, as finally located, starts in the United States, parallels the river a short distance until it crosses into Mexico, and then turns west, following an old river channel until it returns to the United States, but to build and operate the



NOTE.—Above design for 34,000,000 acre-foot reservoir. Present plans call for 26,000,000 acre-foot capacity, which will reduce height of dam about 50 feet.

canal the consent of Mexico had to be secured and in negotiating Mexico made a shrewd bargain.

That country required the promoters to form a Mexican corporation. To this corporation the Mexican Government granted a concession to build and operate a canal through Mexican territory on condition that up to one-half the water diverted should be delivered to Mexican irrigators if they desire it. These Americans, looking at the full river and the unpeopled desert, had no misgivings as to any ultimate shortage of water. They signed on the dotted line.

With water assured, the irrigable land in California was soon settled and the struggle to develop irrigated farms by men with little capital, and to operate a canal under difficult conditions began. It tested the resourcefulness and fortitude of both settlers and canal managers. The river broke through its natural barrier, left its old channel and flowed north into the Salton Sea, across the new settlement, flooding towns and irrigated farms

and threatening to convert the sink into a great fresh-water lake and thus make the greatest change in geography to be found in all history.

It took the resources of the Southern Pacific Railroad, the broad, public spirit of E. H. Harriman, and the genius of Epps Randolph and Harry Cory, of the Southern Pacific, to close this breach. It cost the Southern Pacific over a million dollars, which has never been repaid.

Before that occurred the canal management had, in the great volume of silt which the river carries, a difficult obstacle to overcome. The slower velocity of the canal caused the water to drop its silt burden in a short distance. Two dredges working night and day could not throw it out as rapidly as it was deposited. It required another million dollars to build a head gate that would draw water off of the surface of the river instead of taking in the sand moving along the bottom

Then the channel of the river changed. When it was turned back by the closing of the breach in its bank a jungle-like

(Continued on page 40)

## THE IRRIGATED AREA IN IMPERIAL VALLEY AND MEXICO

*Owing to a combination of advantages, such as cheap labor and water and lower taxes, the irrigated area is extending in Mexico more rapidly than in the United States*

(Continued from page 39)

growth had sprung up in the moist bottom of the old channel which formed a barrier to its flow and made it easier to turn west across the arid and unwatered plain. Doing that, made artificial levees necessary to keep the river from flooding over its banks along miles of its course.

Keeping out the floods is a continuous source of expense and anxiety. Many millions of dollars have been expended on levees and canals. These difficulties have not, however, checked agricultural development or the growth of the towns. Irrigated agriculture is attractive and profitable, and the valley is peopled by a remarkable body of enterprising and aggressive farmers and business men.

### INTERNATIONAL COMPLICATIONS

This brings us to the international question. The prosperity of the Imperial Valley in California and the great wealth in land and cities which it has created showed the possibilities of the land under this canal in Mexico. Eight hundred thousand acres of this was held in a single Spanish grant, and an enterprising American syndicate, made up of citizens of Los Angeles, bought this and have brought about 200,000 acres under irrigation. In this development thousands of oriental laborers are employed at wages far below

those of the United States. Taxes are also lower and water is cheaper, and this combination of advantages enables cotton to be grown more profitably on the Mexican side of the boundary than on the American.

As a result, the irrigated area is extending in Mexico more rapidly than in the United States, and there have been a number of brief periods when there was not enough water in the river to supply the demands of both Americans and Mexicans. During the whole of September, 1924, the farmers of the valley saw their crops wither and perish because there was not half enough water in the river to meet the combined needs of California and Mexico, but as the Mexicans are at the head of the canal and as they were entitled to one-half the water, while there was twice as much land irrigated in California, the pinch and loss came mainly on American irrigators, the damage being estimated at \$6,000,000.

American irrigators find themselves, therefore, in this position. They financed and built the canal. They have to maintain and police the levees that protect Mexican land as well as their own. They have to operate under very difficult conditions. Sometimes they have to pay tariff charges when shifting

mules across the border in carrying out emergency work on the canals or levees. This has led for a number of years to a growing feeling that there ought to be regulation of the river that would provide an adequate water supply for seasons of drought, and that there ought to be either an all-American canal or an amendment of the Mexican concession for the existing canal that would enable it to be operated on fairer terms.

There is only one way to regulate the flow and that is by a reservoir. There is no chance to build a reservoir after the river enters the plain on the lower 300 miles of its course, but there are opportunities for dams and storage in the great gorge below the Grand Canyon. Long and careful investigations have finally accepted as the most satisfactory site what is known as Boulder, or Black Canyon, about 300 miles below the head-gate of the Imperial Valley canal. Here a dam of almost any height can be built. Two, one of 550 and one of 605 feet, have been most carefully studied, and the one of 550 feet, which would impound 26,000,000 acre-feet of water, has been adopted. The average yearly flow of the river is 16,000,000 acre-feet; hence a reservoir holding 26,000,000 acre-feet would impound, without any release



Imperial Valley head lettuce being crated for Eastern markets; 15,000 carloads will be shipped this year. Approximately 25,000 acres of lettuce will be harvested during the coming season

whatever, its average flow for one and one-half years. This makes it possible to so regulate the discharge as to carry over the excess of flood years for those of drought and by so doing avert danger of floods or of drying up canals in dry seasons.

#### **COST OF THIS DEVELOPMENT**

To build this dam and an all-American canal will cost about \$70,000,000. It is more than agriculture can afford to pay. Fortunately, there is no necessity of its bearing the entire burden. A dam 550 feet high, with a regulated annual discharge of 16,000,000 acre-feet of water, gives an opportunity for a large and profitable power development, and the great cities of California, the mines and industries of Arizona furnish a practically unlimited demand for this power. It is possible to build a power plant capable of generating a million horsepower which will generate continuously, and still meet the requirements of irrigation, 550,000 horsepower. It is proposed to sell this at the switchboard at a price which will bring in a gross annual revenue from power and irrigation of over \$12,000,000, and a net revenue of about \$6,000,000, which could be placed in a sinking fund to meet interest and repay the cost. The estimated cost of the power plant is \$35,000,000, making the total expenditure for power, irrigation, and domestic water supply \$105,000,000.

This development not only makes it possible to extend and protect irrigation but insures complete financial solvency, and it can do this and furnish power so

cheaply as to constitute a great stimulus to the development of industries in the Southwest.

Thus far we have referred only to the present needs of irrigation. We have not referred to the development of new areas along the lower course of the stream in both California and Arizona. These in time could be expanded so as to double the present irrigated area. There is, however, another and more weighty reason for constructing this storage. Los Angeles is now a city of more than a million people. Its manufacturing possibilities, its attractive living conditions render it certain that its growth and that of surrounding cities are to continue. If it does, more water must be provided. The supply which Los Angeles now obtains from Owens River, through an aqueduct 234 miles long, is practically absorbed in municipal uses and irrigation. Either more water must be provided or the irrigated lands must be turned back to aridity, which to anyone who has seen the agricultural development of the San Fernando Valley is unthinkable. The situation at Los Angeles is duplicated at Pasadena and other important coast cities. Their wealth and prospects justify a large expenditure to provide an additional water supply, and for this they must go to the Colorado River.

The dam and reservoir at Boulder Canyon would therefore protect the lands now irrigated, help to adjust the international water rights with Mexico, extend irrigation along the lower part of the river, provide an adequate supply of pure water

for domestic uses to the growing cities of the Southwest, and make possible the generation and sale of cheap power.

#### **THE INTERSTATE COMPACT**

Before this can be done there must be an agreement among the States that lie in part within the watershed of this stream and provide the water to be stored. These States desire to see their respective rights in the river adequately protected. To accomplish this result a commission was formed a few years ago, made up of representatives of the seven States and of the United States Government. The commission reached an agreement by which the stream was divided into two sections. Of the 16,000,000 acre-feet average yearly flow of the river, the upper section was to have 7,500,000 acre-feet and the lower section 8,500,000 acre-feet. Six States ratified this agreement, but Arizona has thus far refused to approve it.

The building of this reservoir without some guaranty to the States above would be a menace to their rights by establishing a large prior right. It is proposed, then, that the legislation for this work shall declare that it recognizes the binding effect of what is known as the Colorado compact, and that rights of the upper States established under that compact shall control.

These are the fundamental features of the bill introduced in the Senate by Senator Johnson and in the House by Congressman Swing. When this bill was

(Continued on page 42)



Picking Imperial Valley cantaloupes, of which 15,000 carloads were shipped last year



## THE UTILIZATION OF THE COLORADO RIVER

(Continued from page 41)

submitted to Secretary Work, of the Interior Department, for report, the Secretary, who is a believer in keeping the Government out of business unless there are weighty public reasons therefor, gave it long and careful consideration to ascertain whether it would be possible to arrange with some private corporation to build these works, but he found so great the difficulties in reaching an agreement regarding State rights, the difficulties which have already arisen in an attempt to allocate the benefits of this development if built privately, the need of some adequate and entirely impartial authority to reconcile and adjust the burdens and benefits of power, irrigation, and water supply, to protect interstate rights and deal with Mexico, that he is convinced it is in the truest sense a national undertaking.

### FINANCING CONSTRUCTION

The Secretary recommended, therefore, that this work be financed through a bond issue rather than through direct appropriations from the Federal Treasury. If this is done there will be no interference with the fiscal operations of the Government. It will not require the Government to contribute one dollar in the way of subsidies. It will be carried out under a business organization, paying interest on all the money advanced, providing a sinking fund for repayment of the costs, and using the Government only as a means for obtaining the money on more favorable interest terms than it could be obtained otherwise and as the powerful

agency to protect interstate rights and reconcile and adjust the diverse interests involved in its operation.

This arrangement has the approval of the upper States. It has the approval of the Imperial Valley. It is believed it will have the approval of the whole country when the need for its enactment and the plan of development are fully understood. Carrying out this work will give new life and confidence to the Southwest. It will mark the beginning of better interstate relations between irrigators on the upper and lower sections of the stream, and it is hoped that it will put an end to the unsatisfactory conditions under which irrigation is now carried out on the two sides of the international boundary.

### DR. ELWOOD MEAD GIVES RADIO TALK

Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, gave an address on "Economic Aspects of the Development of the Colorado River" from Station NAA, the Naval Radio Station at Arlington, Va., on Saturday evening February 20.

Doctor Mead discussed the three main features of the proposed development involved in the construction of the Boulder Canyon Reservoir, namely, irrigation, flood protection, and power development, as well as the economic value of the project from a national standpoint including the relation which the proposed development bears to American and Mexican interests in the lower Colorado River Basin.

The Secretary of the Interior recently approved the Swing-Johnson bill, with certain suggested amendments, providing for the development of the Colorado River.

## COLORADO RIVER BILL—A FEASIBLE MEASURE

**A**FTER suggesting several amendments in line with his recommendations<sup>1</sup> on the original bill, Secretary Work has informed the House Committee on Irrigation and Reclamation that the revised bill for the protection and development of the lower Colorado River, in his opinion, constitutes a feasible and workable measure.

This bill was drawn up in an effort to meet the proposals of Secretary Work for changes in the Swing-Johnson bill for the construction of the project through a Federal bond issue, including protection of the rights of the upper States and central control by the Government of the power, water, and other privileges.

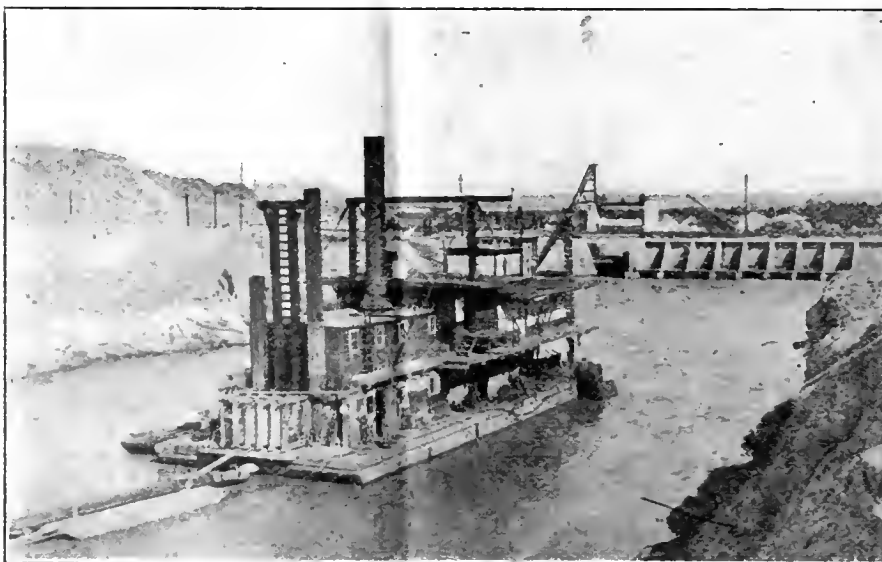
Not all the recommendations proposed by the Secretary in his first report, however, were accepted by the committee, and the supplemental report amplifies such of these suggestions as were omitted from the new bill.

The most important amendment proposed to the revised bill is in connection with the All-American Canal. The Secretary suggests that the bill be changed to leave optional the construction of this canal in the event that Mexico is unwilling to modify the terms of a concession made by that country to an American corporation relating to the transportation of water through the present Imperial Valley canal.

An amendment is also suggested to remove the granting to certain organizations of preference right to electrical energy developed at the dam. The report recommends that the allocation, sale, and delivery of this energy be left to the discretion of the Secretary of the Interior after opportunity has been had for exhaustive consideration of the public interest and the equities and needs of the applicants.

As to a proviso in the revised bill which suggests two alternatives to the method originally proposed for generating and disposing of electrical energy, namely, the alternatives of leasing of generator units or the leasing of water for the development of power, the Secretary states that inasmuch as the alternatives are left wholly to later determination, thus permitting further study, it is deemed unnecessary at this time to discuss the relative merits of the alternatives in the bill.

The report concludes with the expression of opinion that the bill, with the amendments suggested in the supplemental report "will constitute a feasible and workable measure, under which the purposes sought to be attained through this development may be accomplished."



Suction dredge removing silt below Hanlon Heading

<sup>1</sup> See New Reclamation Era for Feb., 1926.



## SUGAR BEETS ON THE PROJECTS

**S**UGAR beets valued at \$4,373,500 were grown on 13 Federal irrigation projects in 1925.

A recent compilation shows that 679,024 tons of sugar beets were grown in that year on 54,748 acres of land on the Grand Valley and Uncompahgre projects, Colorado; Minidoka project, Idaho; Huntley, Milk River, and Sun River projects, Montana; Lower Yellowstone project, Montana-North Dakota; North Platte project, Nebraska-Wyoming; Klamath project, Oregon-California; Belle Fourche project, South Dakota; Strawberry Valley project, Utah; and Shoshone project, Wyoming. This represents a yield of 12.4 tons per acre compared with 8.6 tons in 1924, and an average value of \$79.88 in 1925 compared with \$61.47 in the preceding year.

The largest area in sugar beets, amounting to 21,178 acres, was on the North Platte project, the value of the 308,627 tons of beets amounting to nearly \$2,000,000, or \$91.81 per acre. The largest yield per acre, amounting to 16.1 tons, and the largest value per acre of

### Sugar beets on the projects

Project	Year	Acreage	Yield		Value	
			Total	Per acre	Total	Per acre
			<i>Tons</i>	<i>Tons</i>		
Grand Valley.....	1924	2,580	21,682	8.4	\$173,460	\$67.23
	1925	1,704	23,377	13.7	151,950	89.20
Uncompahgre.....	1924	5,934	43,210	7.3	324,082	54.61
	1925	4,205	53,510	12.7	347,815	82.72
Minidoka.....	1924	11,550	41,916	3.6	273,008	23.63
	1925	7,039	67,972	9.6	475,804	67.59
Huntley.....	1924	5,929	58,860	9.9	529,722	89.34
	1925	4,456	40,572	11.1	322,278	72.30
Milk River.....	1924	230	1,500	6.5	11,280	49.04
	1925	1,009	7,772	7.7	50,518	50.50
Sun River.....	1924	61	360	5.9	2,888	47.34
	1925	200	1,756	6.7	10,537	40.52
Lower Yellowstone.....	1924	6,690	63,970	9.1	383,820	58.21
	1925	6,952	60,202	8.7	361,272	55.97
North Platte.....	1924	22,087	255,980	11.5	1,740,351	78.79
	1925	21,178	308,627	14.5	1,944,349	91.81
Klamath.....	1924	206	1,335	7.4	12,280	59.61
	1925	1,281	9,860	7.7	86,249	67.32
Belle Fourche.....	1924	1,238	19,997	16.1	164,975	133.25
	1925	7,568	53,560	7	374,892	49.53
Strawberry Valley.....	1924	4,712	61,208	13	367,251	77.94
	1925	272	344	1.2	2,070	7.62
Yakima.....	1924	272	344	1.2	2,070	7.62
	1925	272	344	1.2	2,070	7.62
Shoshone.....	1924	2,797	26,570	9.4	209,406	74.86
	1925	1,789	23,496	13.13	164,472	92.49
Totals.....	{ 1924	66,879	577,762	8.6	4,111,228	61.47
	{ 1925	54,748	679,024	12.4	4,373,501	79.88

<sup>1</sup> 1,111 acres frozen and not dug.

<sup>2</sup> 353 acres frozen and not dug.

## APPLE CULTURE ON THE PROJECTS

**T**HE value of apples grown on 12 of the Federal irrigation projects in 1925 amounted to more than five and a half million dollars.

### Apples on reclamation projects

Project	Year	Acreage	Yield		Value	
			Total	Per acre	Total	Per acre
			<i>Pounds</i>			
Orland.....	1924	3	10,000	3,333	\$188	\$60.00
	1925	3	13,500	4,500	750	250.00
Uncompahgre.....	1924	1,727	7,093,665	4,107	107,316	62.14
	1925	1,640	6,647,985	4,053	95,354	59.36
Boise.....	1924	1,698	3,687,045	2,172	87,047	51.66
	1925	974	5,587,976	5,747	94,963	97.50
King Hill.....	1924	325	196,950	606	5,086	15.65
	1925	251	1,036,186	4,115	18,334	72.80
Minidoka.....	1924	63	58,130	922	1,162	18.44
	1925	190	498,373	2,643	2,492	13.11
Carlsbad.....	1924	10	20,000	2,000	605	60.50
	1925	7	3,375	481	150	21.43
Rio Grande.....	1924	412	4,880	118	241	58
	1925	578	5,349,105	9,254	130,509	225.79
Umatilla.....	1924	455	( <sup>1</sup> )		1,105	2.43
	1925	382	883,225	2,312	18,548	48.55
Klamath.....	1924	2	20,000	10,000	400	200.00
Strawberry Valley.....	1924	157	605,150	3,855	12,103	77.08
	1925	221	1,477,683	6,686	27,439	124.16
Okanogan.....	1924	3,525	25,000,000	7,092	656,218	186.12
	1925	4,038	35,847,000	8,805	900,158	222.92
Yakima.....	1924	16,390	121,369,120	7,405	3,279,245	200.07
	1925	15,528	219,017,554	14,104	4,380,351	282.08
Shoshone.....	1924	34	35,760	1,052	894	26.29
	1925	7	1,045	149	31	4.48
Totals.....	{ 1924	24,801	158,100,700	6,375	4,151,040	167.39
	{ 1925	23,758	276,495,324	11,217	5,673,680	238.81

<sup>1</sup> Failure.

<sup>2</sup> Estimated.

A recent compilation shows that in that year 23,758 acres were included in apple orchards on the Orland project, California; Uncompahgre project, Colorado; Boise, King Hill, and Minidoka projects, Idaho; Carlsbad project, New Mexico; Rio Grande project, New Mexico-Texas; Umatilla project, Oregon; Strawberry Valley project, Utah; Okanogan and Yakima projects, Washington; and Shoshone project, Wyoming, produced 276,495,324 pounds of apples, valued at \$5,673,680, or \$238.81 per acre. Although the total acreage in 1925 was about 1,000 acres less than in 1924, the value of the apple crop in 1925 was more than a million and a half dollars greater than in the preceding year and the value of the crop per acre more than 40 per cent greater.

The Yakima project in Washington leads all other projects in acreage, yield, yield per acre, value, and value per acre. Sixty-five per cent of the total acreage, nearly 80 per cent of the total yield, and more than 75 per cent of the total value of apples are found on this project. On this project the average value of apples per acre in 1925 amounted to \$282, compared with the average value per acre of all the projects of \$238.81. Other projects on which the average value of the crop per acre exceeded \$200 are the Orland, Rio Grande, and Okanogan.

## SECURITY AND INCOME ESSENTIAL ON NEW PROJECTS

*These two desirable conditions must be created. The safest way is to put on the land a good settler with some capital, which creates the security, and then loan him money on terms he can meet on a mutually agreed agricultural program to create income*

*By George C. Kreutzer, Director of Reclamation Economics*

(NOTE.—Recently Mr. Kreutzer received a letter raising the question of whether there was any necessity for aid in settlement, and expressing the belief that the question of settlement and farm development could be ignored in the future as in the past. The article below is Mr. Kreutzer's reply.)

**I**F we look backward at the irrigation development in this country a careful analysis will show that only in rare cases did the investors who bought the securities of irrigation enterprises have returned to them their original investment and the annual interest those securities were supposed to earn. In Colorado, even as far back as 20 years ago, the records showed that there were only two irrigation enterprises in the State, constructed by borrowed money, which had fully met their obligations. The other enterprises adjusted their debts with their creditors, the adjustments varying from compromises in interest to a complete repudiation of their obligations. These projects were simple as compared with projects now considered for construction both by private interests and the Government. Irrigation securities have not been purchased generally by those familiar with these records. My acquaintance with engineers, contractors, and business men who live in or near irrigation developments has disclosed that not one has an irrigation bond of a new irrigation district in his safety deposit box.

The financial record of Federal projects is only a little better than the record of the projects constructed by private interests and that is due to the interest-free feature of the debt and to the generous relief granted from time to time, which undoubtedly was abused but in some cases where a profitable agriculture had not been developed was needed.

This default in the payment of bond interest on privately developed projects and needed relief on Federal projects is due entirely, except when organized repudiation prevailed, to the lack of skilled cultivators on the farms and a general program of intensive agriculture on the project. Skilled cultivators and intensive agricultural conditions finally prevail on projects where soil, water, and climate are favoring, but the time between this condition and the pioneering stage is too long, and serious financial losses are incurred both by settlers and the development agency. The Turlock and Modesto districts of California required 15 years to accomplish this, yet, in my opinion they were surrounded by the most favorable economic conditions of any districts I know of in the West.

### GOOD INCOMES FROM GOOD FARMS

I think you will agree that good incomes are made only on farms that are well tilled and well equipped. To get a farm in that state requires that it be cleared, leveled, ditched, fenced, and that buildings are constructed to house the family and livestock. The successful farmers generally have work stock and tools. These can't be borrowed. Take the analysis of developing and equipping a 40-acre farm, as given in the economic report on the Vale project, and let us criticize it to see if intensive agriculture can be accomplished safely and more cheaply.

The land is valued at \$7.50 an acre. The committee now values it at about \$10 an acre. The house is to cost \$600. The family who lives in that house won't have a bathtub nor running water in the kitchen. The best that can be secured for that amount of money is three small rooms with no conveniences. A barn is given at \$400, yet a good barn will cost \$1,000. The slightest consideration given to the cost of chicken houses, pigpens, well and pump, fences, and corrals will show that they are a minimum. They are all needed. The chickens can't roost on the sagebrush. You must have stock and domestic water and a pump to get it out of the well.

### SMALL CAPITAL MEANS SLOW DEVELOPMENT

Forty acres of clearing and leveling are given at a cost of \$1,000. Some say, let him do it himself. If he does, he and his family must eat and his work stock must be fed and every bit of it must be bought. Even a good settler can't work much over 10 or 12 hours a day. His first need is a house, outbuildings, domestic water, and a corral. When he is providing these needs he is not clearing and leveling land and planting crops. Generally this part of his program is neglected. My experience has been that the new settler with an initial capital of \$2,000 or \$2,500 is fortunate if he clears and prepares 10 acres of irrigation the first year. The sum of \$1,000 must be put into this improvement. It makes little difference if it is spent under contract or for hired labor, food, and supplies. If it isn't put in, delayed development will result except in rare cases. The other items for equipment, livestock, seed, operating expenses, and personal expenses are at a minimum.

If they are not, I would be glad to know the exceptions. Yet with these minimum expenses the total shows an expense the first year of \$5,600.

In paragraph 18 of your letter you state that in your experience it has been found that only about one-fourth of \$7,000 is needed to get a settler established on 80 acres of sagebrush land. You state that \$20 an acre is needed to put the land in alfalfa or clover. I think your estimate is low for average conditions for this character of development. If the land was quite smooth it could be done. Granting that this figure is correct, he still has a house, outhouses, fences, domestic well, livestock, and equipment to provide. He must have food while he is developing the farm. I would like your estimate of what these things ought to cost for an 80-acre farm in Idaho, because it will give us a comparison with the figures we have on this matter.

In paragraph 17 reference is again made to the cost of developing farms at about \$20 an acre. You do state, however, that this does not include any expensive outbuildings. My judgment is that it only included clearing, leveling, ditching, and planting crops. If this is all that has been put into the farm, then those things enumerated in the previous paragraph are needed to make it a going concern for a resident settler.

### CAPITAL REQUIREMENTS

I think you misunderstand the capital requirements of settlers as discussed in these reports. In paragraph 18 of your letter you refer to a great number of tenants having teams, farm machinery and tools, and furniture. If they have these things, then it follows that they do not have to buy them. It is, however, part of the settler's capital and is as useful as money to him. The regulation promulgated under subsection C of the act of December 5, 1924, recognizes this by the statement that the settler shall have at least "\$2,000 in cash, or the equivalent thereof in livestock, farm equipment, or other assets deemed to be as useful to the settler as cash." All discussions of the capital requirements of settlers recognize that farm equipment, livestock, etc., are a part of the settler's capital.

Your statement that few men who have reclaimed land in the arid West had \$7,000 in cash to begin with is certainly true. When we subscribe to this statement we must not overlook the fact that a con-

siderable amount of money invested in these irrigation works was lost, and even in the more successful enterprises is not yet repaid. Also, conditions have changed. Water rights are not cheap. Twenty years ago a water right costing \$25 an acre was considered high. We will start construction on a project shortly where the water right will cost \$160 an acre. Everything that goes into a farm costs from two to three times as much as it did 20 years ago. This applies to every commodity the settler buys.

#### WHEN LOANS ARE MOST NEEDED

In paragraph 22 reference is made to the Federal land bank and that any advances it could not make may be unsafe. The land bank is an institution detached from reclamation. It makes loans from only two viewpoints. One is that the loan shall not exceed 50 per cent of the value of the land. The other is that the farm shall be brought to such a state of production as to insure that the borrower can pay all his fixed charges, including the installments to the bank, and live. Both principles are sound when the loaning agency does not control the land and can not supervise the expenditures of the loan. Local banks and other loaning agencies are in the same position. This condition leaves a gap in the development program of settlers between the time they have spent all of their money and the time the farm is brought into profitable production. It is at this time most of them go broke and that delinquencies occur in the repayment of their obligations. In actual cases it is usually the third year after settlement. At this time loans are the most effective agencies to avert disaster, and as yet no agency is designed or clothed with the necessary authority to make them. A practical application of rendering this assistance would be to loan the settler 50 or 60 per cent on improvements effected by his own labor and capital to complete the development of the farm or buy good stock, if these were needed to increase earning power. The loaning agency must control the title to the land. The loan would only be made on a program agreed to by both the settler and the agency, and the funds turned over only as fast as that program materialized. This is where the supervision comes in. A lack of such a complete program has been the cause of the land bank and other loaning agencies acquiring too many farms in recent years. In many cases the capital from loans did not go into good stock, leveling, and other reproductive investments. Too much went into the purchase of more land, and, in many cases, automobiles and other luxuries.

The loans we refer to that should be made under supervision satisfy both the conditions set up by the land bank. The security must be there, and, secondly, the loan itself, when expended to create a profitable agriculture, guarantees that the income will be sufficient to repay it. No one who advocates this plan ever thought that loans would be made in any other way. I wish you would particularly consider the two points involved in these loans and find a flaw from the standpoint of sound business. I would particularly like to defend the plan.

#### SECURITY AND INCOME MUST BE CREATED

The weakness of the past irrigation development program on both private and Federal projects is that the construction of the system is accomplished with borrowed money and is therefore a loan, yet the only security given is raw land of low value and no immediate earning power. The land itself is generally not worth more than a few dollars an acre. Earning power is only to be had when some one puts capital and labor into the farm so that the construction debt may be paid. It is like building a factory without putting the machinery in it or like having a cattle ranch without cattle. Certainly it has neither of the two conditions demanded by the land bank before making a loan, viz, security and income. These two desirable conditions must be created. The safest way to do it is to put on the lands a good settler who has some capital, which creates the security, then loan him money on terms he can meet on a mutually agreed agricultural program to create income. This is the only way to get early farm development and consequent earning power if the settler has not the capital to do it himself. If we insist on both security and income before the works are built, then not another reclamation project could be built. What is being insisted upon is a program that will create these two desirable conditions, which may be accomplished by State aid, Federal aid, or even private sources. It matters little which one does it as long as it is a part of the reclamation program.

Your reference to land speculation and the conditions written in the Kittitas contract as safeguards is certainly meritorious, as these will do away with one of the evils of reclamation. That in itself will not create prosperous farm owners or an intensive agriculture. This can only be done by completing the job, which is to provide for farm development and organized settlement.

## MARKETING FACILITIES ON IRRIGATION PROJECTS

In the December issue of the *NEW RECLAMATION ERA* lists, by projects, were printed of cooperative organizations or groups of farmers associated for marketing agricultural products, of organizations or individuals who contracted during the year with the water users for growing specified crops and the acreage and value of crops so contracted, and of manufacturing concerns on the projects for changing raw products into more concentrated form.

At the time of going to press not all the projects had submitted the data requested. The following supplemental data have been furnished by the following projects:

#### MILK RIVER PROJECT, MONT.

*Cooperative organizations.*—Livestock-marketing association; livestock-shipping association; poultry-marketing association; poultry-shipping association; three elevator companies; farm bureau; two shipping associations; certified seed-potato growers' association; cooperative association; alfalfa growers' association; produce company.

*Crop - contracting organizations.*—A sugar company contracted for 6,000 acres of beets, with an estimated return of \$450,000.

*Manufacturing concerns.*—Three creameries; three flour mills; a sugar factory.

#### CARLSBAD PROJECT, N. MEX.

Francis G. Tracy, of the Carlsbad project, N. Mex., calls our attention to the fact that there are seven cotton gins and one cottonseed oil mill on the project.

#### GRAND VALLEY PROJECT, COLO.

*Cooperative organization.*—Potato growers' exchange; beet growers' association.

*Crop-contracting organizations.*—A sugar corporation contracted for 1,743 acres of sugar beets, with an estimated return to the growers of \$155,480. Canning companies contracted for 252 acres of tomatoes, with an estimated return of \$35,500. In addition a large tonnage of pumpkin, beans, apples, beets, and cherries were canned, returns from which are not known. A seed company contracted for 131 acres of beans, sweet corn, pop corn, pumpkin, and squash, with a return of \$8,550.

*Manufacturing concerns.*—A sugar corporation; two canning companies; flour mill; milling company; creamery; and packing company.

The bureau was well represented in the recent department exhibit at the National Education Association meeting.

## FARMERS: INVENTORY AND APPRAISE CHARACTER! III

*It is under stress that the possession of character or the absence of it is brought into clearest outline, whether the consequence of stress be a determination to make good in spite of difficulties or in discouragement or finally in despair*

*By Copley Amory, Expert in Reclamation Economics*

IT is noteworthy that on these reclamation projects on which many farmers are in default for construction and other charges certain farmers not more advantageously placed than their neighbors are nevertheless not in default and are successful and spurn help.

These cases of contentment amidst discontent and of competence amidst need must be due to character. The dictionary defines character as attributes due to nature, habits, or environment. These attributes of character are intelligence, energy and integrity, and the greatest of these is integrity.

Such three attributes of character have made the American farmer what he is, but are not shared in equal degrees by all farmers. It thus comes about that the possessor of these qualities may prosper alongside of a neighbor who is without them. The delinquent believes, and often honestly, that the world is at fault for his troubles and that relief from outside is rightfully due him. In times of stress the appeal is louder, the sense of injustice greater, and the danger of a sympathetic but mistaken response from Government agencies more acute.

### THE ORIGIN OF CHARACTER

It is under stress that the possession of character or the absence of it is brought into clearest outline, whether the consequence of stress be a determination to make good in spite of difficulties or in discouragement or finally in despair. If the reaction be determination we may be sure that it is due to character and that form of character which the dictionary describes as "the sum of good qualities which distinguish one person or thing from another."

Whence comes this quality of character which can scarcely be seen or heard or measured except in action and which is especially visible under stress? It can not be bought or borrowed. How, then, can it be acquired? It usually descends from father or mother or both to son. It sometimes skips one generation and arrives again with all its genuine earmarks in the next. One of its peculiarities is that having some, more can come, by mere resolution in about the same manner as increase comes to a savings bank account—by mere resolution carried out to have more. Its possession is attended too by this circumstance, that the more one has of it the easier it is to acquire

still more, indeed, "unto him that hath shall be given."

Its possessor does well to give frequent attention to his inventory to observe whether character is listed there. As a means of noting and appraising character, it is only necessary to observe the progress of the farm, the contentment of the family, the regard of the neighbors, the well-being of the livestock as measured in the smoothness of their coats and the placidity of their eye. And whence comes it? Like the petroleum underground, it has a long history, further back than the beginning of our civilization and further back into that long indefinite period of prehistory to when men first protected their wives and families from wild animals and from their predatory neighbors, from when, later, they conducted long voyages by sea or migrations by land, and, later still, when Englishmen came overseas to settle in the wilderness of the eastern Atlantic coast.

### THE CONNECTICUT SETTLEMENT

As a part of this migration, and perhaps the most significant part, the history of the settlement of Connecticut River Valley offers an interesting example. This example shows how people of character develop from nature, habit, and environment more character, and how, after a century and more, devoted this, their character, to the development of our whole country.

The Connecticut Valley in 1633 was a virgin forest, mostly of white pine, from Long Island Sound to its source, some 350 miles nearer Canada. Here was a fertile valley with an ample and well-distributed rain fall, a genial climate, as temperate climates go, and healthy though with extremes of heat in summer and cold in winter. Its nearest point was three days' march from any settlement on the coast.

This valley was infested as to its whole length with Indians, one or more tribes of whom maintained hostilities almost continually for 150 years. These Indians possessed firearms soon after their contact with our settlers and far outmatched them in the art, reluctantly acquired by white men, of forest warfare. For the first 200 years of their struggle to maintain themselves the valley farmers depended upon their farms for food and clothing, necessities and luxuries, guns, powder, and iron excepted.

The land required to be cleared and stumped and laborers in the field to be constantly protected by sentinels from Indian stealth. Their markets were those of barter and were home markets until the enterprise of the coast communities afforded an export outlet for their produce to many parts of the world, and in fact wherever the vessels of the whaling industry went. Ax and plow, scythe, cradle, and gun were their implements; their spinning wheel and looms their textile machinery; their Bibles, their books; and for some of their early years of settlement in the lower valley they were their own beasts of burden.

### QUALITIES OF SELF-RELIANCE AND HARDIHOOD

These conditions grafted on to their already sturdy character resourcefulness, self-reliance, and, in the process of natural selection, strength and endurance. That this natural selection was in active operation the large families in which the least fit did not survive infancy is in evidence on the tombstones of all New England graveyards. That hardihood was one of their qualities let the history of the towns of Cornish, in New Hampshire, and Windsor, in Vermont witness.

Midway between the river's banks and in sight of these towns a small alder-grown island lies. Every year soon after the disappearance of the ice the boys of Cornish and Windsor swam out, each boy with his knife between his teeth. On reaching the island each cut an alder branch and each sought by belaboring the naked skin of his opponent to prove his better courage and maintain possession of the island. And, again, in none of the families of the poorer farmers did they have the protection of underclothes or socks from the cold of their rugged winters. Again, they mowed their grass and cradled their grain without the aid of mowing machines or reapers, and labored during daylight to cut each man perhaps his acre a day, helped by a ration of New England rum which each man carried to the field. Again, they fought the Indians for possession of their lands, giving for a long time odds in numbers, and continued the warfare from generation to generation. Again, their sons helped man the whaling vessels of Nantucket and coast towns and brought the whale oil from the ends of the seven seas to compete with their homemade tallow dips. Again, they served in the



expedition of Lewis and Clarke, and afterwards, among the early pathfinders, led the way in trapping and prospecting. They later helped reclaim the prairies, and later still the plains and mountain valleys for agriculture. Again, they published at home many books and newspapers of a high order at a time when their earlier settled neighbors in Quebec scarcely knew the advantage of print and were for the most part without education. Again, they and their neighbors of New England established town government and a system of public education upon which American progress is based. Again, and at a later date, they established those industrial and financial corporations which have contributed in great measure to the industrial development of our country the control of many of which have only in recent years passed to larger communities.

#### ENERVATING INFLUENCES ON CHARACTER

If this story of fortitude and progress serves to illustrate the meaning of character and helps us to visualize the service of character in the development of agriculture and of our complex modern life, the same story serves to illustrate also how the maintenance of this character is essential for the continuance of the well-being of agricultural communities and is in turn their contribution to the strength and stability of the Nation.

In order to inventory character we must learn to recognize it, and in order to appraise it we must visualize its origin, its development, and significance. As to its prevalence in agriculture to-day, when we seek to recognize it we then find its supply is diminishing, and upon attempting to appraise it that its quality is less virile and that its sources are drying up, because modern industrial life is unsympathetic and almost hostile. Just as the extraordinary attainments of Indian character decayed before civilization, so the character of that rugged sort essential to enduring agriculture decays before the self-indulgence and enervating influence of modern life. This decay of character begins on the farm before its actual contact with the indulgent and enervating influence of urban life. The advantages of city life, more apparent than real, as portrayed in movies and comic pictures, attract and raise false hopes.

The Connecticut River men led the way across the prairies over the Mississippi and later, and as a smaller proportion of all the pioneers, across the plains and Rocky Mountains until now farther westward progress is limited by the Pacific Ocean. All the wealth of fertility formerly to be had for the asking, not often conserved but often lavishly used or

wasted as soon as possession was taken, is ended forever.

When, like Balboa, he reached the Pacific Ocean, the pioneer turned half round and viewed the continent, but, unlike Balboa, finds its worth-while spare places all occupied. He hesitated, questioning whether to accept the new conditions of agriculture, abandon his pride of independence, exchange his sense of having been a man of business, a speculator in land, for his new and inevitable lot of a toiling cultivator, pure and simple. Now undoubtedly the wiser turn back again eastward and resolve, prompted by that inherited character, which we have inherited and appraised and which has always stood in time of need, to become cultivator, conserve the remaining fertility of the soil, and accept thrift, diligence, and self-denial as the price of prosperity. They must, too, as a part of the new condition, realize that the cultivator is a constantly diminishing minority no longer able to assert even such political rights as he formerly could, but content with what he can exact as a suppliant. In the course of the farmer's political history since the Civil War he has made a succession of efforts to receive special consideration at the expense of other political groups. Each succeeding effort has met with less consideration and success than its predecessor, and has shown, even though the lesson has been largely lost, that relief for himself and for his industry lies in remedial measures applied from within and not from aid, however well its nature may be concealed, from without. They now begin to see

that in order to maintain the influence due to even this minority they must hastily learn from the other estates what knowledge of organization, propaganda, and effrontery can do, and how essential they now are, even as essential as the gun and plow of early days, or as later, the pioneer spirit, to maintain them in anything like their former relative position.

#### NO EASY REMEDY

The lesson of the manufacturer and his tariff, the transport worker and his Adamson law, the other workers and their unions, the restriction of emigration, this last helping all but himself and helping others at his expense, spreads before his confused vision. As the economic laws governing his land, and his farming operations expand in clearer knowledge, he even now only just begins to realize that he can only diagnose his case, and comes there to an abrupt halt.

No quick or easy treatment, at the same time equitable and available, is at hand to save him. If he has the tradition, leisure, and inclination, he can recall the story of early settlers. If he chances to have still sufficient of this character of his forbears, and I think he has, he will join the successful minority of his brother farmers and evolve at first painfully and slowly, by again breaking himself to labor and from the experience of modern civilization in other countries, many systems of self-imposed disciplined cooperation, in both production, distribution, and marketing, which will bring him to his own and along with his own welfare the safety and welfare of the nation.



Mormon Flat dam, Salt River project, Ariz.



## FARM PROBLEMS IN THE SOUTHWEST<sup>1</sup>

By Hon. Thomas E. Campbell, Chairman Southern Division, Board of Survey and Adjustments

**M**R. CHAIRMAN, ladies, and gentlemen, I have been assigned a subject that is interesting to me and interesting to all who are interested in reclamation, and that is "Farm problems in the Southwest." I could answer that in a single sentence—that we have no problems down there except more water, because we chance to be blessed with sunshine, climate, and soil, so that the result is that the other things come.

I have been interested in this subject a long time, even before we had a reclamation act, because we in the Southwest appreciated that if we wanted to make of these great areas a section of this Nation which would be worth while we would have to bring the water to the land; we could not depend on rainfall. Of necessity it meant that we had to be a part of some movement of this kind. I am proud to be here testifying to our belief in this great experiment.

We heard yesterday discussion of the settlement question and everybody seemed to concur in the idea; at least I noticed that we all bobbed our heads about the three sets of settlers to settle up projects. The facts are that 65 per cent of the original settlers on these projects are still there. We also hear it said that so many people come to these projects, and have come to them, without any previous experience or knowledge of reclamation in the art of irrigation—that they are shoe-makers, barbers, broken-down lawyers, etc. The facts are that 73 per cent of them had previous farming knowledge. We find this interesting thing on the so-called good projects. I refer with a good deal of pride to those in my own section of the country. We find on the Salt River 90 per cent had previous experience; two projects in New Mexico, 94 per cent. The same thing would hold true as to the type of people. They are American-born people.

We also hear a good deal about tenantry. It is a problem. I am taking the average of the tenant proposition. We had referred to yesterday some very interesting tables here showing the tenantry in Illinois, Indiana, and in the South, and if you recall it ran over 50, 60, and 70 per cent over a period of two, three, and four years. The smallest percentage of tenantry is upon the poorest projects, indicating that the tenant is the professional mover. He goes to the projects where he can make the most money. He stays away from those where the income

is small and it is impossible for him to make a living.

### NO OVERPRODUCTION

We find also the question of over production discussed from high sources, yesterday referred to by Secretary Jardine, this morning by Congressman Smith. As to bringing in new areas of lands, and particularly referring to the subject of reclaimed lands, I find this interesting thing—that the total gross production this last year on all of the so-called Federal reclamation projects is a little less than 1 per cent of the total agricultural production last year of the country as a whole. It is interesting to note that this production is of a type of agriculture that is not competitive with the other areas that are antagonistic, in my opinion, to a promulgation of this idea. The only thing that goes on a general competitive market is cotton. The other productions are fruits, nuts, and vegetables out of season, or else it is for local consumption. A great quantity of alfalfa goes into the feeding on the farm or local competition. It does not move into the other districts unless there is a scarcity and the freight rates allow it to move into other points.

### NO POLITICAL PRESSURE

It was also stated here yesterday, and I noticed that it received a good deal of applause, that one of the difficulties was a political selection of projects and not a selection by merit. Having enjoyed the confidence of the people of my State for a number of years in public service, I think probably I can qualify as a politician. I am going to defend the people who are referred to as politicians. The original act prescribed that a major portion of all the money derived from the sale of public lands at that time should be expended in the States or region, but the selection of projects from 1902 to 1910 was left to the Reclamation Service. It was very interesting to me in my studies on the Fact Finding Commission interrogating the two directors of the service at that time as to what effect political pressure had on them in the selection of these projects that, with the exception of one, they stated there had been no political pressure brought upon them. This was the Milk River, which involved an international question between this country and Canada. The projects selected were the best projects

available in those prospective States, and following the mandate of the law they selected them where they did.

Since 1910 the selection has been in Congress, and only two have been selected since that time. This is a political government and every activity of the Government reflects political action; we can not get away from that. We don't get away from it in our traffic laws, bonus, and pension, Federal aid, location of public buildings, harbors, and rivers. Every physical activity of this Government is political because it reflects the demands of the people who send representatives here, and the interesting thing to me is that we don't make more mistakes than we do. I don't give very much weight to the fact that we can not be efficient because we are political. I appreciate that that might be a fact, but that is one of the penalties we pay for having our form of government where we are represented.

I intended to make some comparisons of the good and poor projects, but they are always odious. The only purpose was to draw certain conclusions which this study we have been on for some time makes possible, but we do find this situation—that the great difficulty, in my opinion, in agriculture, and it has this effect on the question we are discussing this morning, is the fact that the farmer's dollar is not big enough compared with the other dollar. I say that because where they have high production in the southwestern projects we have no difficulty in the matter of settlement.

### MUST RAISE PER-ACRE INCOME

The four southwestern projects—Salt River, Yuma, Carlsbad, and Rio Grande—have a total area of 445,000 acres. That represents approximately 26 per cent of the total area to be irrigated and 33½ per cent of the total irrigated to-day; but when we find that from 26 per cent of the area, 58 per cent of the gross production occurs, you can appreciate that we have not any settlement problems. There is not any in that country. The average gross production over the last five years is \$94.45 as against an average over all the projects (in which that percentage is also included) of \$54.45; the point being that, in my opinion, wherever people can make production comparable with the present demands of living and desire in this country you don't have those problems.

<sup>1</sup> Address delivered Dec. 15, 1924, at the Conference on Reclamation and Land Settlement, Washington, D. C.

Wherever the production is low then we have what may be termed our "sick projects."

One of the projects referred to by Mr. Kreutzer in his talk had an average production of \$16.50, which includes the big war years, running up during the war to \$25. That can be improved, and the problem that confronts reclamation today is to increase the production upon all projects that have less than a \$40 production. I don't believe that there can be the so-called successes and continue on this work unless we can approach \$40 an acre as a minimum.

It is interesting to refer to the whole situation of agriculture, and when I say in round figures that the income from agriculture at the present time, according to figures taken from the Department of Agriculture, shows only a net return on an American farm of approximately \$200 a year, out of which a man must live—the things outside of his rent and his food—and 6 per cent on his investment, it is not very alluring. What laborer in the city, or business man if he had an investment of \$5,000, would think of working all year long for his rent, fuel, food, and \$200 a year? So I say that Doctor Widtsoe said a mouthful when he said that agriculture is not a business but a mode of living, and we who are interested in reclamation, in the perpetuity and expansion of the idea of reclaiming the waste places, the cut-over lands, the skimmed-milk lands of the New England States, must look upon it not as a business proposition, one that is going to make money, but, as a foundation for a type of people that will carry on the ideals of this Nation. It is a mode of living, and my observation is that on the average projects just three kinds of people are going on them—the rich man who has made his and wants to go back on the land to get this mode of living; he does not care for profits. The other man is the intelligent tenant farmer who never purchases land; and the other fellow is the man who has been referred to here as the foolish man who has made a failure elsewhere. Those are the three types who are going on to the farm. The farmer who is already there desires to live and bring up his family under that sort of environment. That is the observation that we have found all over this whole country.

#### NEW DAY FOR RECLAMATION

So far as reclamation is concerned, I believe we can go forward. We have taken stock of our situation and we have to face it. In my opinion, there will be

## RURAL ECONOMICS IN PALESTINE

**D**OCTOR MEAD received recently an exceedingly interesting bulletin on "The transition from primitive to modern agriculture in Palestine," written by I. Elazari-Volkani, director of the Zionist Agricultural Experiment Station, and one of the former pupils of Doctor Mead at the University of California. Just prior to his return to the United States to take up his work on the Fact Finding Commission and later to become Commissioner of the Bureau of Reclamation, it will be

#### Cost of equipment for 25 acres of diversified farming in Palestine

	1925
Dwelling, two rooms 26 by 13 feet.....	\$875.00
Horse and cow barn 24½ by 13 feet.....	550.00
Poultry flock house.....	75.00
Barn for implements and grain.....	150.00
Planning.....	50.00
Fencing home garden and farmyard.....	50.00
Pipes for water installation.....	50.00
1 mule.....	150.00
2 cows.....	250.00
25 chickens.....	25.00
Beehives.....	25.00
Harness.....	20.00
One-half of a wagon.....	75.00
One-half of a plow No. 7.....	15.00
1 local light plow.....	5.00
One-fifth of a harvester with platform.....	35.00
One-tenth of a mower.....	12.50
One-tenth of a rake.....	6.00
One-fourth of a heavy harrow.....	6.25
One-fourth of a light harrow.....	5.00
Small tools.....	50.00
Manure and fertilizer.....	100.00
Seedlings.....	100.00
Seed.....	75.00
Community plantations.....	25.00
Part in the community bull.....	25.00
Part in the threshing machine and tractor.....	100.00
Part in the hay hopper and grain crusher.....	5.00
Blacksmith outfit.....	7.50
Feed for cattle.....	200.00
Food for settler, first year.....	210.00
Oil for deep plowing.....	50.00
Unforeseen expenses.....	122.75
Total equipment.....	3,500.00

a 15 per cent loss that should be written off on this experiment. That is a small percentage. You have had figures presented in other activities. You don't hear about those, but this big experiment seems to have been put aside by itself. I believe that if the recommendations now being presented to the Congress by the Secretary of the Interior and the Commissioner of Reclamation are put into effect that there will be a new day in reclamation. If we take the position that reclamation in its entirety (and I look upon it as a national proposition) is something for the welfare of this Nation, just like the Federal aids of Forest Service or harbors and rivers where you are creating something where nothing existed before, and that it is for the advantage of this Nation looking not to to-day, nor yesterday, nor in a direction of economy, but looking forward to 10, 15, 20, or 50 years from now, why, then, it will live.

recalled that Doctor Mead spent considerable time in Palestine as a consultant in connection with the Zionist movement, the rehabilitation of agriculture, and planned rural development in that country.

Excellent philosophy and good common sense characterize Mr. Volkani's contribution to rural economics. A few scattered examples must suffice:

"In no place and in no country is the path of the agriculturist strewn with roses. Rather is it full of pitfalls."

"We must always keep before our eyes as our objective a national economic system which can serve as the basis for a large settlement, not the success of isolated farms."

"One thing is clear; that if the earth does not yield its produce, and the cows do not give milk, and the fowls do not lay eggs, then all our new experiments in colonization will fail as the old ones failed."

"From empty udders it is impossible to extract milk, even if there is a separate drawer for each teat; and from impoverished land crops can not be produced, even if the pressure of the population is doubled, trebled, or quadrupled."

Included in the bulletin are a number of tables. One of the most interesting to those who have followed in this country the discussions concerning the cost of equipping a new farm shows the cost of equipment for 25 acres of diversified farming in Palestine, and is reproduced here for the year 1925.

I am hopeful that if we meet here a year from now something will have been accomplished to the end that our settlement program will go forward, that reclamation, both West and South, may have a new birth. [Prolonged applause.]

The family living from the farm lends safety and stability to the farm business and to farm life. It enables the farmer to reduce materially the cash cost of living and to tide over lean years and hard times that would be ruinous if he had to buy all the living for himself and family on the market.

Crops may be harvested by livestock economically when the quantity trampled down and the injury to the soil does not exceed the cost of harvesting by hand.

## THE WATER REQUIREMENT OF PEARS

*The usable water capacity of a soil and the concentration of the soil solution, particularly the nitrate content of orchard soils, are of commanding importance as affecting water requirement*

*By Prof. W. L. Powers, Oregon Agricultural College*

**A** KNOWLEDGE of soil, plant, and water relations is needed to utilize wisely the natural productive resources of the West in efficient production of foodstuffs for the benefit of all the people.

Water is a daily need of every living thing. It gives high productive value to arid soil of good quality. The amount of water required by crops affects the cost and feasibility of proposed reclamation projects. Frequently in the western States the productive area is limited not by the amount of good soil but by the water available. If we could save half the water now used in irrigation it would almost be possible to double the productive irrigated area permanently. Prevention of waste of water should be a chief object of the irrigator, not only for the sake of economy but for the good of the orchard as well.

### SECURING HIGH EFFICIENCY OF WATER IN ORCHARDS

To secure high efficiency, or economic use of water in an orchard, ample spacing of trees should be provided. Adequate thinning of the fruit must be performed. Excessive wood growth and leaf growth is controlled by avoiding a high-moisture content early in the season. This may result in demanding moisture that the fruit may need later in the season. The leaves will transpire an excessive amount of water and may deprive the fruit of light. Lewis, Kraus, and Rees found that heavy irrigation or a high moisture content and the resulting leaf growth made pear trees more susceptible to blight.

### COVER CROPS AND TRANSPIRATION

Cover crops greatly increase the water requirement in an orchard if maintained on the land during the growing season. Such crops will tend to take up available nitrates or compete with the fruit trees for these and other nutrients. Sowing a fall cover crop may remove usable moisture from the soil and aid ripening of wood growth for winter. An exceedingly dry soil at the beginning of the winter season is inadvisable. Some suggest a light dormant irrigation after the fruit has matured. This would be useful in starting the cover crop. Where water is scarce and valuable only winter cover crops may be practicable. Hairy vetch or Hungarian vetch are suitable. The

former has perhaps a slight advantage as to hardiness. If the water supply will permit growing the shade crops alfalfa or sweet clover can be used. If the growth is clipped or allowed to lodge a mat should accumulate and in time nitrates should accumulate so that no depressing effect from the shade crops would be experienced with the trees. Irrigation and the use of alfalfa intercrop on the Medford soil-experiment field (or Bernst tract) over a period of years has caused marked improvement in the pear trees, even though the early growth was harvested for hay. The water requirement of an orchard when intercropped will be about twice as great. With an alfalfa intercrop it will be as great as though a solid meadow were maintained. Sixteen years' studies of water requirement with alfalfa by Oregon Experiment Station indicate the crop-producing power is not likely to be less than 5 inches of water per ton.

### FERTILITY IN RELATION TO TRANSPIRATION

The relation of fertility to water requirement is important. It was formerly said "The richer the soup the less required." A better explanation is that the more concentrated the soil solution the less is the absorption of particles of water in proportion to needed nutrients. (With a high concentration of salt in the soil solution, as in alkaline lands, there may be no absorption of water, or ex-

osmosis may occur.) Supplying any needed nutrients results in a lower water cost. Nitrates will frequently be the limiting or most needed element with pears or other fruits. As far as conditions permit, nitrates should be secured from the growth and decay of legumes or nitrogenous organic manures. Application of barnyard manure to certain acres of the adobe soil on the Bernst tract has greatly improved soil conditions under the pear trees. The soil has improved in absorptiveness and retention of moisture and the fruit produced on manured areas has been of excellent quality.

### GRAIN STRAW MUST BE USED WITH CAUTION

Grain straw and like organic refuse may render a soil more mellow or too loose if applied in excess, but the depressing effect of grain straw is largely due to the decomposition organisms competing with the growing fruit for available nitrates in the soil. Experiments have been under way for a year at the Oregon station wherein composts of grain straw treated with ammonium sulphate and with moisture and reaction control are giving promising results as a method of balancing the nitrogen-carbon ratio, and for reducing straw quickly to a condition like rotted manure. Soluble nitrates can be promptly applied to a tree with the aid of irrigation, which will carry them promptly into solution and to the roots.



A 3-year-old pear orchard on the Rio Grande project, New Mexico-Texas

### TIME, AMOUNT, AND FREQUENCY OF IRRIGATION

The amount of irrigation per season is dependent upon the time, amount, and frequency of irrigations. In dealing with these factors it is fundamental to keep in mind that the amount of irrigation desirable is that which will replenish the soil up to its usable capacity for moisture throughout the root zone. The time should be such as will maintain a moderate, uniform moisture content throughout the growing season, be largely marketed in the fruit, or used out of the soil so that good shipping quality of fruit will be secured at harvest time. It is also fundamental to keep in mind that any plant requires a maximum amount of moisture when it is setting and filling its fruit, whether it is a common species of the orchard, garden, or field.

The light dormant irrigation is good economy where only flood water is available. A little usable moisture, unless provided by precipitation, should be supplied to aid nitrification and solution of plant food throughout the winter season. Some usable moisture in the dormant season will favor root growth, as was long ago shown by McClatchie in Arizona experiments. Irrigation may be withheld in the spring to good advantage until the soil warms up, and only a moderate amount of moisture supplied early in the season, as excess water then will generally make extensive leaf growth, which may come at the expense of root development or fruiting. Pruning reduces and nitrate fertilizer increases the leaf area in relation to the roots.

### IRRIGATION IN RELATION TO FRUITFULNESS

Cover crops on young orchards may help young trees hold down the size of fruit and the leaf development. The lack of moisture was found by A. F. Barss to result in less fruit bud formation and less fruit. Moderate supplemental irrigation gives brighter color, smoother fruit, and larger yield.

Chandler says: "It is probably better for a normal growth of fruit if there is in the soil enough water for good, though not excessive, development of the tree and the steady growth of the fruit," and that "high transpiration and lack of moisture may increase the 'drop' of young fruit." Irrigation four to six weeks before picking will be most effective in sizing up fruit, while late irrigation may injure the skin or shipping quality.

Jones and Colver studied irrigated and unirrigated fruits in Idaho and found that the unirrigated fruit was slightly higher in sugar, acid, and in some instances in-

soluble in water. This would indicate that late irrigation would reduce the quality of pears. According to Gardner "either excess or deficiency of soil moisture is likely to be accompanied by disturbed conditions within the plant." Excess may encourage splitting, chlorosis, and soft or water-cored fruit. A deficiency may favor premature defoliation and ripening and be followed by decreased vitality and die-back. Bennett finds the osmotic concentration of leaf sap higher than pear sap, and the pressure test used by the Oregon station to determine timeliness of picking has indicated removal of moisture from fruit with a resultant increase in resistance in some cases. This may tend to prevent ill effects from irrigation near picking time.

Time and amount of irrigation will vary with the weather conditions, water capacity of the soil, as well as the demands of the growing crop.

### PEAR ORCHARD IRRIGATION STUDIES IN 1925

The Oregon Experiment Station is co-operating with the United States Department of Agriculture, Bureau of Rural Engineering, in irrigation studies on coarse "grayitic" and heavy adobe soils of Rogue River Valley with Charles Hartmann, jr., in charge of the field trials.

Experiments this past season on clay soils east and south of Medford show that the soil that is allowed to become too dry before irrigation resists wetting. By following irrigation with a second irrigation after two or three days it was possible to store a fair amount of water in rather heavy soils, the resistance to wetting having been overcome by the first irrigation. A  $\frac{3}{4}$ -inch opening proved best on sloping climax clay adobes with runs of 400 and 600 feet long. A run of 1,320 feet did not prove too long on the flat adobe soils just south of Medford. A pipe of  $1\frac{1}{2}$  inches diameter feeding water into a deep, rough furrow proved suitable. It was found difficult to store more than 2 or three inches irrigation in this soil or to secure penetration of more than 2 feet. Four to six furrows should be used between the tree rows. Few active roots can be expected in dry soil where the moisture does not penetrate. The use of manure, vetch, sweet clover, and ammonium sulphate is being studied to aid in improving penetration of irrigation water on this soil. Two irrigations of 2 to 4 inches, the first late in June, the second late in July, appear to be a good practice for the heavier soils of the valley. In the lighter soils light, frequent irrigations and a total of 6 to 12 inches may be required. Good orchard soil management and economic use of water go hand in hand.

## GOOD FARMING ON YAKIMA PROJECT

**S**ATISFACTORY returns from diversified farming were obtained last summer by Thomas McLain and son, of Outlook, Wash., on the Sunnyside division of the Yakima project, from 80 acres of land which they own and operate. Sixty-eight and one-half acres are cultivated; 3 acres are used for two dwelling houses, with yards, corrals, and gardens, and  $2\frac{1}{2}$  acres for pasture, with 6 acres of waste land.

Alfalfa, corn, and potatoes were raised, with the following results:

53 acres alfalfa, at $4\frac{1}{2}$ tons per acre, 238 tons, at \$15 per ton.	\$3,750.00
Cutting, at \$1 per ton.	\$238.00
Baling, at \$2.50 per ton.	\$95.00
	533.00
8 acres corn, at 58 bushels per acre, 464 bushels at $87\frac{1}{2}$ cents per bushel.	406.00
$7\frac{1}{2}$ acres potatoes, at $11\frac{1}{2}$ tons per acre, $86\frac{1}{4}$ tons, at \$38.	3,577.50
Seed, at \$20 per acre.	\$150.00
Digging, at \$2 per ton.	172.50
Sacks, at \$1.50 per ton.	129.38
	451.88
$2\frac{1}{2}$ acres pasture; 4 head stock pastured 5 months, at \$3 per head per month.	60.00
71 acres, at \$91.67 per acre.	6,508.62

The corn ground was plowed, harrowed, and irrigated three times and cultivated five times.

The potatoes were planted on alfalfa land which had been disked twice and harrowed once, then drained, ploughed and harrowed four times. After planting, the potatoes were cultivated six times and irrigated ten.

All of the hay land was harrowed once, part of it twice, and irrigated three and four times, three cuttings being obtained.

Five head of horses are used in their farming operations; a few cows bring in a small income each month, as well as adding to the fertility of the soil, and about 175 Rhode Island Red chickens net a fair profit for the labor and feed.

Every livestock feeder should make a study of conditions on his farm with the idea of feeding such products as are being wasted.

The wise feeder soon learns that the proper use of all farm by-products, waste, and surplus crops for livestock feed often constitutes the main difference between profit and loss in feeding.



## APPLE PRODUCTION ON THE OKANOGAN PROJECT

*The experience of John S. Petersen, described below, indicates clearly what can be accomplished through perseverance and by following approved methods in planting and caring for his orchard*

*By Calvin Casteel, Superintendent*



Farm home of John S. Petersen, Omak, Washington, on the Okanogan project

**I**N 1902 John S. Petersen settled on a homestead of 160 acres on Pogue Flat with the thought that this land, along with other lands being settled on about the same time, would come under irrigation by the united efforts of the settlers. In fact, work was started that year to build a feeder canal from Salmon Creek to Brown Lake, a matter of 4 or 5 miles, part of the distance being heavy construction. From Brown Lake a short canal of a few miles and a distribution system would have put the water on the land. The reclamation act was passed in the same year, and one of the settlers, reading about it, solicited the Government to make an examination of the possibilities of a project.

Mr. Petersen started in with a very modest house at first and has built on and added to it until he now has a very comfortable home. It is quite modern and up to date. His radio keeps in touch with the markets and furnishes entertainment to all.

In 1903 the first surveys were made of the Okanogan project, and in about three years the project was approved and construction completed in 1910. Water was available for Mr. Petersen's land in 1909.

In the spring of 1909 he planted 5 acres, which had been previously cleared and prepared, to orchard, principally apple trees. The next year he planted 10 acres to orchard. The following year he planted 10 acres of his nonirrigable land,

lying adjacent to and above the upper main lateral, to orchard, and in 1912 he planted 5 more of his nonirrigable land to orchard. He then had 15 acres of orchard on irrigable land and 15 acres on nonirrigable land. The latter area was kept growing by securing a little water from Brown Lake, a few miles away, and by intensive cultivation. In 1918 he secured 14 acres of project water right, by transfer from a worthless sandy tract, which he has since pumped onto this area from the upper main lateral, the lift being about 30 feet.

### PLANTING THE ORCHARD

In planting all the orchard he used extreme care. A hole 4 by 6 by 2 feet deep was dug; the top soil was put back into the hole first, and then the tree placed in it so that the roots were in no wise cramped. The growth secured on the trees the first few years seemed to justify the effort. To see the orchard now one would not believe it was ever very rocky, but Mr. Petersen says that almost a load of rocks was dug out of many of the holes. In planting this way, with one man helping, only about 25 trees per day were planted, while it is the usual thing to plant from four to six times as many.

Like most homesteaders, he did not have an abundance of cash and did some outside work while waiting for the water, but with the water available began growing crops between the trees. The

crops grown were potatoes, tomatoes, corn, cabbage, and strawberries. Tomatoes were the most successful financially. The marketing of these crops was a problem. There was no railroad, wagon roads were merely trails, and only horses could be used for distances of 30 to 60 miles to shipping points or markets. A living was made by this cropping between the trees until his orchard came into bearing.

Mr. Petersen has always used considerable barnyard manure on his orchard, and of late years some commercial fertilizer, and has had alfalfa between the trees as a cover crop for the past several years.

Mr. Petersen has found it necessary to supplement his gravity supply of water during years of a short supply by pumping some from a small lake (Duck Lake) near his place and by pumping from a well on his place. In this way he has had ample water to keep his trees in a good and healthy condition but at a high per acre cost.

In order that an average crop may be grown each year, careful thinning is done. With a heavy load on the trees the apples are thinned out so that they are 8 to 12 inches apart. This distance apart is less when the trees are not so heavily loaded.

### GOOD CROPS EVERY YEAR

His place came into bearing about 1916, and in 1918 produced a good crop, and since that time has been fairly constant in yielding a good crop each year. There has been generally an increase in production each year. This year his production amounted to about 500 boxes per acre, with one block of Delicious trees producing 1,750 boxes of apples per acre, or an average yield of 35 packed boxes per tree.

To determine when it is time to irrigate, the ground is tested by digging with a shovel and inspecting the condition of the subsoil.

The spraying of his trees and fruit, to combat the numerous pests that are always attempting to defeat the purposes of all orchardists, is done very carefully. As an example, he puts on two calyx sprays, when one is the general rule. The purpose of this is to spray all blossoms as nearly as possible at the right time. Not all blossoms come out at the same time. The advice of the expert horticulturist employed by the State is followed closely as to time and manner of spraying.

(Continued on page 52)



## A SUCCESSFUL APPLE ORCHARDIST

*Okanogan Project, Wash.*

*By Calvin Casteel, Superintendent*

**T**HAT it is not always size that counts is as true of orchards as it is of many other things. This is proven by a number of small orchards on the Okanogan project, and particularly by that of Howard Benjamin, who owns and grows apples on one of 6 acres.

Mr. Benjamin came to the project in the fall of 1910 with \$400 and an ambition to grow apples. He bought a 6-acre tract which had been planted to trees the spring of that year. He used all of his capital in making his first payment and took up the burden of the balance of the purchase price of \$1,800 in deferred payments, with interest.

In 1911 he planted fillers between all of his original or permanent trees. These have been gradually taken out until now there are only a few left. Mr. Benjamin claims that by fertilizing heavily he has made them pay, but his case is somewhat exceptional in this respect. However, knowing him, one could expect it.

### OKANOGAN PROJECT APPLE PRODUCTION

(Continued from page 52)

Mr. Petersen's crop for the past several years has been fairly constant as to amount; in fact, so much so that it seems evident that proper irrigation, careful spraying, and drastic thinning of fruit pay well.

Mr. Petersen has a fair sized family, five boys and one girl. Three of the boys are now old enough to help on the farm and he and they do most all of the work except during the rush seasons. The two oldest boys have each purchased 10 acres of land and have planted it all to orchard. With this size of a family, and all at home and working as they become old enough, 40 to 50 acres of orchard is about the right size.

Mr. Petersen is a very enthusiastic apple grower. He believes that there is a bright future ahead for the industry in sections where a high-class product can be grown and a fairly constant yield be secured each year. He says that the market has expanded very rapidly in the past few years, and the acreage growing apples is decreasing from year to year. He is interested in one of the warehousing concerns at Omiak, Wash., and is no doubt in a position to be informed on these matters.

For a time after buying the orchard he lived and batched in a small house with the man he bought from. He secured work as soon as possible. He continued to work out for his neighbors or for the Government on canal work until his orchard came into bearing.

His first unpretentious home was built during his second year on the place. He was able to secure a carpenter to do the woodwork, but found it necessary to put in the concrete foundation himself by lantern light after doing a day's work elsewhere.

#### SMALL ACREAGE BEST

Mr. Benjamin does not have any new or novel ideas about fruit raising, but believes that one man with 5 or 6 acres has all that he can do caring for it, and even then it is necessary to hire some help during the harvest season and for thinning. For the first few years he hauled a large amount of manure to his land, and of course still continues to use some. His ground was clean cultivated for the first five years, and it was then seeded to alfalfa. Since the orchard has come into bearing he uses  $\frac{1}{2}$  a ton of nitrate each year and not less than 20 tons of manure.

When the first year of water shortage came along he was one of the first to dig a well to be used for irrigation. With this well Mr. Benjamin has had all the water that he has wanted during the past several short years. Part of the time he has used his portion of the project supply. The cost of his well and machinery has amounted to \$1,000, and the operation of it has cost him \$500, making \$250 per acre which he has paid in eight years, besides paying all project assessments but one and taxes assessed when due. He believes confidently that it has paid him to make this effort.

He was married in 1919, and in 1921 built a very nice and comfortable home. Mrs. Benjamin is very much interested in the orcharding problems and helps out a great deal at times when extra help must be had.

Mr. Benjamin's crop for this year amounted to more than 3,400 boxes of apples. In harvesting this crop only the picking was done by hired help. Mr. Benjamin did the hauling and packing and Mrs. Benjamin and her daughter did the sorting. The items of sorting, packing, and lidding of boxes saved them over

\$500 alone. This handling of his own crop was made possible by building a small but good and modern storehouse on the farm. This building is not large, but is big enough to hold the entire crop of winesaps. This gives him all that is necessary in the way of storage to pack out all of his own crop, as all of the earlier varieties of apples are packed out and hauled to the railroad before the freezing weather comes.

Mr. Benjamin follows pretty closely the advice of horticultural experts in the handling of his orchard. He believes that constant attention to business and enough water for irrigation are the essentials, and that an apple orchard in the Okanogan country can be made to yield good returns if the water and labor are properly applied.

Mr. Benjamin's experience would prove that 5 to 10 acres is a large enough orchard for one man to handle. This can also be proven by a number of others with small tracts on the project. He is enthusiastic about the growing of apples and believes that nearly any price can be paid for water if an ample supply is secured. His success and experience so far have borne out this statement.

### IRRIGATION PROJECT APPROVED IN INDIA

Assistant Trade Commissioner Donald Renshaw, of Bombay, India, as reported in a recent issue of Commerce Reports states that an irrigation project in the Madras Presidency has received the approval of the local legislature, and the Government of Madras is anxious that it should be undertaken without delay.

The project has two main objects: To improve the existing fluctuating water supplies for the present delta irrigation of more than 1,000,000 acres, and to extend irrigation to 301,000 acres of land now irrigated. The undertaking involves: (1) The construction of a large masonry dam on the Cauvery at Metur, which will form a reservoir with an effective capacity of 2,066,000 acre-feet. The object of this dam is to store the flood waters of the river, passing them down to the delta as required. (2) The construction of a main irrigation canal about 88 miles in length, with a connected distributary system, having its offtake on the right bank of the Cauvery, upstream from the existing Grand Anicut. This proposed work has been designated the Grand Anicut Canal. (3) The improvement and extension of the existing Vadavar Canal in the Cauvery delta. The intention of the Madras Government is to finance the project by loans raised in the open market, supplemented, if necessary, by loans from the Government of India.

## HUGE CONSTRUCTION PROGRAM OF RECLAMATION BUREAU

*The Government is expending approximately \$25,000,000 on new construction of dams, canals, and irrigation works on 12 reclamation projects*

**T**HE work now being conducted by the Bureau of Reclamation is the largest that has been undertaken since the original major projects were built. Included in the construction being prosecuted are three large dams—the McKay Dam on the Umatilla project in Oregon, the American Falls Dam on the Snake River in Idaho, and the Guernsey Dam on the North Platte River in Wyoming. Extensive drainage and canal construction work is also under way on other Government irrigation projects.

In addition to the building of these dams and major works, expenditures are being made by the Reclamation Bureau for construction on the Yumá project in Arizona, Grand Valley project in Colorado, Boise project in Idaho, North Platte project in Nebraska-Wyoming, Carlsbad project in New Mexico, Klamath project in Oregon, Yakima project in Washington, Riverton and Shoshone projects in Wyoming.

### LARGE DAM CONSTRUCTION

The McKay Dam, located on a creek of that name about 8 miles south of Pendleton, Oreg., is nearing completion. It is an earth and gravel fill storage dam, having a maximum height of 160 feet, length of about half a mile, and a volume of two and one-third million cubic yards of material. During the past year 350 to 400 men have been employed on this work. The dam was commenced in 1923 and is nearly completed. It will form a reservoir having an area of 1,600 acres, a capacity of 75,000 acre feet, which will be used as a supplemental supply for the irrigation of 30,000 acres of land in the vicinity of the present Umatilla project. The cost of the dam will total \$2,250,000.

The American Falls Dam is being built across Snake River at American Falls, Idaho, in cooperation with irrigation districts and companies in Snake River Valley. Work was begun on the dam in February, 1925, and, according to the contract with the Utah Construction Co., must be completed by June 30, 1927.

The dam will be almost exactly a mile long and at its highest point about 85 feet high. That part of it across the river and for a considerable distance east of the river is of solid massive concrete with an earth embankment at either end. When completed the dam will contain about 160,000 cubic yards of concrete, 1,255,000 pounds of reinforcing steel, and 2,256,000 pounds of structural steel, operating gates, etc. A roadway will lead across the top of dam.

The reservoir which the dam will create will have a capacity of 1,700,000 acre-feet, covering an area of 56,000 acres. This will be the second largest reservoir built by the Bureau of Reclamation. It will furnish a total or partial water supply to some 750,000 acres of land, most of which is now in a high state of cultivation.

Water will be discharged through the dam by means of 20 gates each 5 feet square. In addition, 2 penstocks, each 15 feet in diameter, will furnish water to the Idaho Power Co.'s plant situated below the dam on the east bank of the river, and four penstocks of the same size will supply water to a proposed plant to be built by the United States on the west bank of the river, with a probable capacity of 40,000 horsepower.

About 2 miles of the main line of the Oregon Short Line Railroad, including depot, grounds, sidings, switches, etc., will be flooded and have been moved to

higher ground. The company's bridge across Snake River has been raised nearly 22 feet, this work being done without interruption to traffic.

As about three-fourths of the old town of American Falls will be submerged, a new town site has been laid out above the reservoir to which the buildings in the old town have been moved. Streets in the new location have been graded and graveled, sidewalks and sewer and water systems built, trees planted, parks laid out, etc. A large new high school building, a new courthouse, and numerous business buildings have been erected.

Irrigation projects and districts have advanced more than \$3,000,000 toward the construction of the dam. The entire cost of the development will amount to \$8,000,000.

The Guernsey Dam, construction of which has recently been commenced by the Utah Construction Co., is located in a narrow canyon 2 miles above the town of Guernsey, Wyo., on the North Platte River. The dam will be an earth and rockfill structure 97 feet high, 575 feet long, having a volume of 332,000 cubic yards, and will form a reservoir having an area of 2,336 acres and a capacity of 72,700 acre-feet for the irrigation of lands on the North Platte project in the States of Wyoming and Nebraska. A power plant with a capacity of 2,500 kilowatts will be constructed in connection with the dam and the total cost of the dam and power development is estimated at more than \$2,500,000. The entire contract is about one-third completed.

### OTHER IMPORTANT CONSTRUCTION

On the Yuma project a 1,200-horsepower hydroelectric plant is under con-



General view of river section of American Falls Dam from east end of railroad bridge

struction at a drop in the California main canal. This plant will cost about \$250,000, and will furnish power for pumping water to the Mesa division lands in Arizona. The foundation of the plant has been completed and the contractor has commenced the erection of the powerhouse.

Construction work is in progress on a number of other irrigation projects, as follows:

On the Grand Valley project, Colorado, a siphon spillway is being constructed at the Orchard Mesa pumping plant, and excavation is also being carried on with drag lines at a number of points in connection with drainage work at a cost of \$200,000.

On the Boise project, Idaho, riprap is being placed for the bank protection and a concrete parapet is being constructed on the main canal in order to increase its capacity, the cost being \$278,000.

On the North Platte project the enlargement of the Interstate Canal is in progress and the construction of the Laramie River diversion canal is under way at a cost of \$465,000.

On the Carlsbad project, New Mexico, concrete lining of the main canal is in progress, and on the Rio Grande project, in the same State, several drag-line excavators are being utilized in the construction of drains, levees, and canals, the total cost being \$1,016,830.

On the Klamath project, Oregon, enlargement of a number of canals is in progress at a cost of \$58,700.

On the Yakima project, Washington, canals are being lined with concrete on the Tieton division, and a wasteway is being reconstructed on the Sunnyside division, the cost being \$65,000. On the Kittitas division rights of way for 27 miles of the main canal are being purchased and specifications are being prepared for the early letting of contracts that will involve an estimated expenditure of \$7,500,000.

On the Riverton project, Wyoming, construction of the Pilot Butte Dam embankments is in progress, together with some lateral excavations. The Pilot Butte Dam embankment will be 42 feet high, 2,400 feet long, and contain 200,000 cubic yards of material. Its cost will total \$189,000.

On the Shoshone project, Wyoming, contract work is in progress on the Willwood division for the construction of canal and laterals at a cost of \$290,000.

An average of 2,500 horsepower-hours is utilized on each farm, of which about 80 per cent is used directly for the production and marketing of crops and the remainder for miscellaneous tasks.

## LAND REFORM IN FINLAND

Land reform in Finland was started in 1918 by an act which allowed the tenant to acquire the holding he was occupying. In 1922 an act was passed which defines an agricultural holding as a property large enough for one family to cultivate by means of its own labor, but not exceeding 60 acres. Such units may be allotted to landless persons. For this purpose land is acquired by the State through purchase or, under certain conditions, by expropriation.

As the purpose of the act is primarily to encourage agricultural production, certain duties are laid on the new tenant. He must reside on his holding, and where no house exists build one within three years. He must prove that he has suffi-

cient practical knowledge of agriculture and owns the necessary equipment, money, or credit for the running of his farm.

In the purchase of property for settlement, the State pays the original owner the value of the crops, salable timber, and buildings, in addition to the price of the land, up to a maximum of 5,000 marks in cash, the rest being allotted in State bonds carrying 7 per cent interest. The settler has to refund an equal amount to the State, either in cash or in early payments of 7 to 9 per cent, of which 7 per cent counts as interest and the remainder for amortization.

It has been demonstrated in practice that if farmers generally would pay wages on the basis of efficiency they could attract a more desirable class of help.

## REPORT OF RECLAMATION COMMITTEE OF AMERICAN ENGINEERING COUNCIL

**R**ECLAMATION has been an important factor in the development of the agricultural resources of the United States. Hence, there is a real need for the continuation of a reasonably fixed policy of reclamation. The policy should be such as to be adjusted to the changing economic requirements of the nation.

The reclamation policy should embody the principle that any project must justify the cost of construction and maintenance by either direct or indirect returns or both, and those sharing in the benefits, whether bona fide occupants of the land, the national Government or political subdivisions thereof, shall bear the entire cost thereof in proportion to the respective benefits obtained.

The Federal reclamation policies of the past have held closely to the principle that the land should bear the entire cost of reclamation without reference to the ability of the land to meet such obligations. This has led to:

- (a) Deferred payments;
- (b) Reclassification of land;
- (c) Federal supervision of land settlements;
- (d) Probable writing off by the Government of many millions of unpaid accounts.

The future policy of Federal reclamation should embody the principle that previous to inaugurating any project there shall be ascertained:

- (a) The producing capacity of the land;

- (b) The ability of the land and the project to meet the cost of construction, operation, and maintenance;

- (c) The practical occupation of the land by responsible settlers.

Your committee believes that the success of Federal reclamation depends upon a continuity of policy in the administration and enforcement of congressional acts relating thereto and that such administration and enforcement should be independent of direct political influence.

Since there is a wide divergence of opinion as to the most practical methods and policies to adopt with reference to reclamation, your committee therefore recommends:

That American Engineering Council have made under its direction a thorough and an impartial study of:

- (a) The fundamental principles involved in a reasonably fixed policy of Federal reclamation;
- (b) An administrative plan looking toward the creation of a Federal corporation, controlled by a small board of directors, authorized to administer and enforce congressional acts relating to reclamation;
- (c) Development of a land settlement plan which may be practiced under such corporate administration

## ORGANIZATION ACTIVITIES AND PROJECT VISITORS

**G**EORGE C. KREUTZER, Director of Reclamation Economics, is again in Washington, this time accompanied by his family, for an extended stay in connection with bureau policies.

District Counsel Alexander and William M. Green, engineer in charge of the Salt Lake Basin project, attended a meeting recently of the Utah Water Storage Commission at Salt Lake City, where matters were discussed concerning the expediting of the preliminary work on the project so that actual construction may be initiated.

Samuel Judd, assistant engineer in the Denver office, was in Kansas City recently inspecting reinforcing steel being furnished for McKay dam, Umatilla project. He returned by way of Omaha, where he inspected the 50 by 50 foot Stoney gates being furnished by the Omaha Steel Works.

Randolph E. Fishburn, consulting engineer, J. F. Schaffer, assistant engineer, of El Paso, and Armando Santaacruz, consulting engineer, who are on the International Boundary Commission between the United States and Mexico, were on the Yuma project at the close of the month.

Superintendent Weber, of the Orland project, has been making trips to Sacramento and Berkeley in connection with Stony Creek water-right adjudication matters.

Assistant Engineer E. T. Eriksen Orland project, spent several days at the office of the district counsel at Berkeley on water-right adjudication and related subjects.

Supt. L. J. Foster and Engineer C. B. Elliott, of the Uncompahgre project, visited the Grand Valley project recently to inspect equipment available for transfer.

J. L. Savage, designing engineer from the Denver office, was on the Boise project for a few days to inspect the repair work on the spillway gates at Black Canyon Dam.

George W. Lyle, chief clerk on the King Hill project during the latter part of 1925, resumed his former position as

bookkeeper at the Burley office, Minidoka project, when the King Hill project was taken over by the water users on January 1.

Senor Jose Nunez Casquete, an engineer from Spain, was a recent visitor at the American Falls and McKay Dams.

### PROJECT DELEGATES VISIT WASHINGTON

*A number of delegations from the projects have been in Washington, D. C., recently in connection with affairs on their respective projects, as follows:*

*Carlsbad project, New Mexico.—H. A. Kerr, president of the water users' association; Francis G. Tracy, vice president; J. H. Lewis, engineer; Judge G. A. Richardson, attorney; George Neal, State engineer of New Mexico; Keith Edwards, Fort Sumner irrigation district.*

*Belle Fourche project, South Dakota.—W. D. Buchholz, secretary Belle Fourche Irrigation District; R. L. Bronson, secretary of the Commercial Club; B. F. Myers, State secretary of agriculture.*

*North Platte project, Nebraska-Wyoming.—James T. Whitehead; William Morrow, attorney for the water users' association; A. N. Mathers, president Gering National Bank and representative of the Gering-Fort Laramie district; Dr. G. E. Condra, University of Nebraska, and personal representative of Governor McMullen.*

*Columbia Basin.—Hervey Lindley, president of the Columbia Basin League, Seattle; James R. Kyle, Stanfield, Oreg.; C. W. Hebbard, Spokane, Wash.*

Miss Dorothy H. David, junior clerk, is a recent addition to the force on the Milk River project.

H. R. Prior, transitman, has been reinstated on the Sun River project.

E. R. Scheppelmann, chief clerk on the lower Yellowstone project, has been designated a fiscal agent.

Millard M. Smith, junior clerk on the North Platte project, has been transferred to the Yakima project.

L. N. McClellan, electrical engineer from the Denver office, has been on the North Platte project recently to consult on questions in connection with the operation of the power system.

S. O. Harper, general superintendent of construction, and J. L. Savage, designing engineer, from the Denver office, visited the North Platte project at the end of the month on matters relating to the construction of Guernsey Dam.

District Counsel Holgate held a conference on the Umatilla project with the directors of the irrigation districts relative to the proposed amendatory contracts under the act of December 5, 1924.

Ray E. Petit, a foreman for many years on the Belle Fourche project, resigned on January 31.

Robert C. Walber, chief clerk on the Belle Fourche project, has been designated a fiscal agent.

The general manager and engineer of the Puget Sound Bridge & Dredging Co. visited the Okanogan project recently for the purpose of looking over the ground, and discussing with the board of directors of the irrigation district the matter of pumping from the Okanogan River into the project canals.

Brooks Fullerton, district counsel at Mitchell, Nebr., for the North Platte, Belle Fourche, and Riverton projects, has resigned from the bureau, effective March 1.

Following the practical completion of the Pilot Butte Dam, Riverton project, R. V. Sass, superintendent of construction, left the project en route for Denver and southern California by auto. Associate Engineer R. B. Dicmer took charge of Government force work on January 11.

W. H. Knox, cost keeper on the Rio Grande project, has resigned and has been succeeded by M. W. Nichols, timekeeper.

H. W. Bashore, superintendent of the North Platte project, and P. J. Preston, superintendent of the Yuma project, have been in the Washington office recently in connection with project affairs.

# NEW RECLAMATION ERA

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NO. 4



TWO-YEAR OLD YUMA MESA GRAPEFRUIT TREE

CITRUS FRUIT GROWN ON THE FEDERAL IRRIGATION PROJECTS IN 1925 WAS VALUED AT NEARLY \$1,000,000, OR \$540.50 AN ACRE



## FEDERAL RECLAMATION

*WHILE just at this time reclamation is almost synonymous with irrigation of arid lands, we do not lose sight of the fact that that word and the policy of the Government include reclamation by drainage of swamp lands, by development of cut-over timberlands, and by fertilization of exhausted farm lands all through the eastern part of the United States. All will be needed in time. Our national necessities will compel us to go forward all along the productive line.*

*Reclamation is not only a matter of producing food for our people. The great thing is the transformation of the wilderness to civilization. It is the occupation and cultivation by the capital and labor of the settler of the unoccupied lands of this country. It is the creation of taxable wealth to help sustain the Government for all future times. It is the establishment of homes. It is the strength of manhood and womanhood contributing to the safety and defense of the Nation. It is the addition to our population of a splendid, enlightened, industrious citizenship which will enhance and enrich the security, the order, the welfare of our common country.*

*—From an address in the House of Representatives  
by Hon. Charles E. Winter, of Wyoming*

# NEW RECLAMATION ERA

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Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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No. 4

## *High Lights on the Reclamation Projects*

**E**ARLY in April the bureau will open to entry 20 farm units on the River-ton project, Wyoming, under the new regulations providing for the selection of settlers on the basis of industry, experience, character, and capital. More details concerning the opening are given in another article in this issue.

**T**HE farmers on the Fort Shaw division of the Sun River project recently shipped out 21 cars of alfalfa. It is to be regretted that an equivalent amount of stock was not shipped in to which this hay could have been fed.

**T**HE work of placing the concrete lining of the diversion tunnel at Guernsey Dam, North Platte project, was completed on February 28. At the end of the month the dam was 39.9 per cent completed, based on contract earnings.

**A**T a recent public meeting of the dairy interests on the Newlands project the officials of the Mutual Creamery Co., owner of the local creamery, presented and explained a plan offering the plant and facilities of the company to the dairymen for operation under a co-operative arrangement. It is understood that the pledging of 2,500 cows under the plan will be necessary.

**D**URING the first two months of the year 190 cars of cotton and cottonseed were shipped from the Yuma project, valued at \$633,000.

**S**ETTLERS are now being selected on the basis of approved qualifications covering industry, experience, character, and capital. Among the first to qualify is a water user on the Sun River project and two on the Grand Valley project. In each case the entryman appears to be well qualified and should prove successful.

**T**HE Grand Valley project reports that an increased spirit of optimism is apparent among most of the water users, and good results are anticipated. Development has been especially striking on the Orchard Mesa where one nursery has set out more than 30,000 peach trees. It is expected that approximately 2,000 acres of the east end of Orchard Mesa will be almost entirely set to peach orchards with excellent prospects of successful horticulture.

**A**PLOT of corn land, measuring 3.4 acres on the Sweitzer place on Garnet Mesa, Uncompahgre project, yielded 390 bushels of shelled corn, averaging 114 bushels per acre. This yield is believed to be the State record for 1925. The corn was well matured, uniform in type, and of a variety known as U. S. No. 133.

**T**HE Ninth Annual Corn and Potato Show of the Uncompahgre project was held recently at Olathe, Colo. The display of exhibits was excellent, and many prizes of merchandise and other articles were presented by the various business firms of the three project towns. The show was particularly gratifying in view of the fact that approximately 800 people attended.

**D**URING February 424 cars of agricultural products were shipped from the Minidoka project, of which 250 were potatoes. Russets and Netted Gems were quoted at \$2.65 and Rurals at \$2.50 per hundredweight.

**O**N February 15 the Utah Construction Co. was notified to proceed with the construction of American Falls Dam to impound 1,700,000 acre-feet, within the limits of available funds. By the end of the month the foundation had been laid for nearly all of the structure that will be required to store 345,000 acre-feet this spring.

**B**IDES were opened on February 24 for the leasing of Tule Lake lands on the Klamath project. More than 300 bids were received, and 214 lots of 30,369 acres were leased for \$29,012.90. After the contracts had been awarded those lots still open were offered at the minimum price of \$40 a lot. At the end of the month 56 lots of 9,420 acres had been let for \$2,240.

**M**ASS meetings were held recently on the Okanogan project to consider the necessity and possibility of installing and operating a pumping plant to pump water from the Okanogan River into the project canals or to pay the Puget Sound Bridge & Dredge Co. for the pumping. The snowfall and precipitation during the first half of February, however, caused the water users to take an optimistic view of the water situation and they decided not to undertake either plan.

**T**HERE has been a considerable increase in payments by the water users on the Yakima project over those of a year ago. On the Tieton division the collections for February were \$17,547.08 compared with \$11,202.78 for the same month in 1925.

**D**EEDS have been secured by the Kittitas reclamation district for practically all the right of way needed for the first four miles of the main canal, planned for immediate construction.

**I**N consequence of the minimum price of \$8.50 a ton for sugar beets on the Shoshone project, which the sugar company is offering in its 1926 contract, there is considerable interest in the crop. About a dozen families of German-Russian beet farmers have moved to the Garland division and expect to contract for 500 acres. It is expected that 2,800 acres will be contracted compared with 1,700 in 1925.

## The Economic Development of the Colorado River

*A radio talk from Station NAA, the Naval Radio Station at Arlington, Va., on February 20, discussing the economic value of the project from a national standpoint, including irrigation, flood protection, and power development*

*By Dr. Elwood Mead, Commissioner of Reclamation*

THE Colorado is one of the large and interesting rivers of the arid region. It is the only one where the valleys are all arid, and where permanent agriculture depends on ability to use water in irrigation. The river has therefore great economic value. Seven States are interested in its division and in works to make its water available. Two great cities, Denver in the Rocky Mountain area and Los Angeles on the Pacific coast, must go to this river for additional water needed for household and industrial uses. Both of these cities are outside the stream's drainage. It takes a long tunnel through the mountains to supply Denver and a 300-mile pipe line to carry it to Los Angeles. The river now irrigates 2,000,000 acres of land once desert. It can be made to irrigate 6,000,000 acres. It now generates electric energy to light a few towns and operate a few mines. It can be made to generate 6,000,000 horsepower.

A bill is now before Congress which, if it becomes a law, will provide \$125,000,000 to build works to make available all the water of the lower third of the river. Under it the United States Bureau of Reclamation of the Interior Department would be given the task of building some of the greatest engineering structures of the world, needed to harness the stream. The Nation will secure thereby social and economic results that will mark it as one of the greatest constructive achievements of the century.

### THE HUGE DAM

The plans for this development include three great structures. The first is a dam across the channel of the river, which from its foundation to its crest will be over 700 feet high, and it will raise the water surface of the river 550 feet. It will not only be the highest dam in the world, but will be more than twice as high as any dam ever built in any country. The highest dam now in existence is the Arrowrock in Idaho, built by the United States Reclamation Bureau, which is 349 feet high. The highest in any other country is the Camarsa Dam in Spain, which is 335 feet high. This dam will loom, therefore, among other dams as the Eiffel Tower does among structures of its class.

This dam will create a reservoir to regulate the flow of the river. The

reservoir will be 86 miles long, and hold enough water to cover 26,000,000 acres of land a foot deep, or enough to cover the States of New Hampshire, Vermont, Massachusetts, Connecticut, New Jersey, and the District of Columbia to that depth.

The average flow of the river for a whole calendar year is about 16,000,000 acre-feet. This lake will hold, therefore, the entire discharge of the river for a year and a half. The great floods which now come down in the spring when the snows are melting will be caught here and held back, to be released later when water is needed to irrigate parched fields. No water will flow over the dam. All that goes down the stream will be let out through its regulating gates which will open into tunnels which pass around the end of the dam and will be cut through the towering cliffs between which the dam will be built.

### THE ALL-AMERICAN CANAL

The second important feature of this development is what is called the All-American Canal. It would start at the western end of the Laguna Dam, a diversion dam in the Colorado, built about 20 years ago by the United States Reclamation Bureau. It is located about 30 miles from where the Colorado River crosses the international boundary into Mexico. The canal would follow the west bank of the river until it comes within a mile of the Mexican boundary; then it turns west through a deep cut, keeping north of the boundary and entirely in the United States, until it reaches the Imperial Valley. This requires a cut 60 feet deep, but it is the only means by which water can reach this valley without passing through Mexican territory.

### THE POWER PLANT

The third feature of the development is a power house to be built just below the dam. When the reservoir is filled, water at the outlet gates will be under a pressure head of over 500 feet, and it will make possible the generation here of a million horsepower of electrical energy. A power house capable of this development is to be built.

The dam will cost \$40,000,000, the All-American Canal \$30,000,000, the

power plant \$35,000,000, or in all \$105,000,000. It is proposed to finance this construction by a Government-bond issue, on which interest will have to be paid while construction is going on and until the revenue from power becomes available. This interest has been estimated at \$20,000,000, making the total proposed bond issue \$125,000,000.

No one questions that this great enterprise will be a financial success. Power revenues alone will pay interest on the development and create a sinking fund to to redeem the bonds in less than 50 years. Water sold for irrigation from the All-American Canal will return the entire cost of that structure and pay all its operating expenses, and, in addition, there will be revenue from water sold to cities and carried in great pipe lines, for which bonds have already been voted by the coast cities of California.

Comparisons serve to show the impressive magnitude of the engineering works needed to harness this river. The dam will be twice as high as any ever before built. The power house will generate twice the electric energy of any now in this country. The canal will cost more than any of the great works of India or Italy.

### SOCIAL AND ECONOMIC NEEDS

About \$2,000,000 has been spent studying the river and gathering information necessary to the selection of the site for this development and preparing plans. This would not have been done if the need for these mammoth structures were not urgent. It becomes interesting and important, therefore, to follow the regulated flow of the river from the dam down to the place of use, and to understand the needs which support this large expenditure in harnessing this stream and the social and economic conditions under which these great structures will perform their service.

Doing this discloses a situation so unique and remarkable as to seem unreal. Nearly all rivers flow through the troughs of valleys, but the Colorado, where it crosses the international boundary into Mexico, flows along the top of the rim of a great bowl or a basin which extends up into California for a distance of more than a hundred miles. This bowl was once an arm of the Pacific Ocean, into which the Colorado River



Imperial Valley shipping shed, where the famous cantaloupes are graded and loaded for shipment

emptied on its eastern side. It is one of the greatest carriers of silt and sand in the world. In time the continued discharge of its burden built a barrier entirely across this arm of the sea, lifted it above the level of the ocean, and evaporation in time created north of it a great basin with its deepest part 300 feet below sea level and with a silt deposit in places 700 feet thick.

### THE RIVER MENACE

This river is kept out of this basin now by means of levees along its north bank, which turn it south into the Pacific Ocean, but water is carried from it by a canal which runs through Mexico into the Imperial Valley, where 400,000 acres are now irrigated and 700,000 acres can be irrigated. Sixty thousand people live on the irrigated lands of this valley, watered from the Colorado, with all of their homes below sea level and from 100 to 200 feet below the level of the river where it crosses the international boundary. Two cities, El Centro and Calexico, will vie with any cities of their size in the United States in their wealth and the architectural attractions of their buildings. Every year the extension of land in the valley intensively cultivated increases. Fifteen thousand carloads of lettuce are being shipped out of that valley this year, mainly to eastern cities. Last year

15,000 cars of cantaloupes, the largest and best in the country, supplied the homes of the outside world. Date palms, citrus orchards, table grapes of wide variety, long-staple cotton are among the contributions to the tables and economic wealth of this country, made possible by the rich soil and varying climate of this valley.

The valley has once been threatened by destruction through inundation. For a year the whole volume of the Colorado poured into this basin, flooding farms, washing away houses, and doing millions of dollars of damage. Now, with the growing use of water along tributary streams and the extension of its use in Mexico, further extension of irrigation is stopped and the farms of the valley are menaced by irreparable loss through drought. In September, 1924, less than a third of the water needed by irrigators came down the river. There had been dangerous floods a few months before, followed by this devastating drought, that in two weeks caused a loss of \$6,000,000 to the farmers.

### AN ECONOMIC NECESSITY

A great dam and reservoir will end this. It will enable the water to be turned out of the great lake it creates just as it is needed. It will enable Los Angeles to have its 1,500 cubic feet a second, with-

out interfering with the rights of irrigators above or below. The power generation will enable farm homes to be lighted at less cost, more wheels of industry to be turned, more mines to be operated, and the industrial development now going on can be continued and thus supplement the increasing wealth of agriculture. More than half a million acres will be added to the irrigated area below this dam. The All-American Canal will give greater security to the irrigators and end the menace of international controversy with Mexico. The plight of the people now living in the Imperial Valley the great increase in wealth and population which will result, make this in the truest sense a national enterprise, entitled to the interest and support of all the people, no matter where they live.

**T**HE Western Slope Creamery Association, which consists of eight creameries, including towns on the Uncompahgre project, is shipping a carload of butter every five days to the California markets. These cars run from 24,000 to 30,000 pounds. It is estimated that more than 70 per cent of the butter produced on the Western Slope is now going to California markets, and more money is being paid to the producer for butterfat, owing to the pooling of shares and the buying of supplies cooperatively by the creameries.

## Special Joint Committee Proposed on Construction Program

*Membership would consist of the chairmen of the Senate and House Committees on Irrigation and Reclamation, the chairmen of the Senate and House Committees on Appropriations, the Director of the Budget, and the Secretary of the Interior*

IN ORDER that expenditures from the reclamation fund may be kept within safe limits of its annual income, Secretary Work has proposed the appointment of a special joint committee to work out a future construction program for new Federal irrigation projects covering the next 10 years.

The suggestion was made in a letter sent to Senator Charles L. McNary, chairman of the Senate Committee on Irrigation and Reclamation. Membership of the committee, it was proposed, would consist of the chairmen of the Senate and House Committees on Irrigation and Reclamation, the chairmen of the Committees on Appropriations of the Senate and House, the Director of the Bureau of the Budget, and the Secretary of the Interior.

Citing that old projects will require \$60,000,000 to complete and new projects now pending before Congress will require \$60,000,000, more or less, to build and that 15 additional projects have been urged on the Interior Department this winter costing about \$40,000,000, the Secretary stated that this program of expenditure was considerably in excess of the probable income of the reclamation fund.

"The average annual receipts of the reclamation fund applied to construction," he continued, "for the past five years have been approximately \$8,500,000. There is no prospect of the annual income being increased during the coming five years. Excluding moneys advanced by private interests to aid in the construction of the American Falls Reservoir in Idaho, the total for last year fell \$2,500,000 below the previous year."

The Secretary pointed out that with this threatened diminution in the annual revenues every increase in the number of projects will mean reduction in the amount allotted to each individual project and that there is also the danger, unless a definite authoritative building program is soon adopted, that the funds will be distributed over so many localities that work will be prolonged, costs increased, and dissatisfaction engendered regarding delayed development in the localities to be benefited.

The proposed 10-year building program, if adopted, could be modified in detail from year to year, the Secretary concluded, and at the same time it would relieve the Bureau of Reclamation and the Bureau of the Budget from continued

pressure for new projects, make their development more economical and efficient, and finally furnish valuable information to the public.

### THE SECRETARY'S LETTER

The letter in full follows:

"There has been spent in Federal reclamation more than \$200,000,000.

"There will be required some \$60,000,000 under present plans to complete old projects, \$25,000,000 of which is being spent now.

"New projects pending in Congress will require \$60,000,000, more or less, to build; while 15 additional projects have been urged on the department this winter that contemplate an expenditure of about \$40,000,000.

"The average annual receipts of the reclamation fund applied to construction for the past five years have been approximately \$8,500,000. There is no prospect of the annual income being increased during the coming five years. Excluding moneys advanced by private interests to aid in the construction of the American Falls Reservoir in Idaho, the total for last year fell \$2,500,000 below the previous year.

"To complete projects already begun and those being considered by Congress would require, therefore, more than the anticipated revenues for the next 10 years. There is now available in the reclamation fund to meet the demand of existing appropriations \$6,500,000. Of this about \$2,000,000 must be reserved for the construction of the American Falls Reservoir.

"In the annual report of the Bureau of Reclamation for 1924 there was incorporated, on pages 26 and 27, a tentative 10-year construction program, beginning in 1925. This program was intended to inform Congress and the public of the demands on reclamation funds for the completion of projects then unfinished, for projects for which appropriations had been made, or for proposed projects being considered by Congress.

"It is evident that this program involves an expenditure considerably in excess of the probable income. Unless some of these projects are to be displaced, the construction program will have to be largely extended and the rate of progress on particular projects made much slower than is desirable.

### NEW PROJECTS URGED

"During the present Congress little or no consideration has been given to this financial situation. The bureau is being continually urged to recommend projects not included in the tentative program. The result is the total of these recommended new projects, which have been introduced in Congress, and for which estimates have been made, aggregates about \$33,000,000. If others for which there are no estimates are included, the total will be somewhere between \$35,000,000 and \$40,000,000. A number of these projects have great merit and should be included in a construction program if there were sufficient funds. With a threatened diminution in the annual revenues, every increase in the number of projects means reducing the amount allotted to an individual one. And there is also danger, if a definite and authoritative program is not soon adopted, that the funds will be distributed over so many localities that the work will be greatly prolonged, its cost increased, and dissatisfaction engendered regarding slowness of development in the localities which are to be benefited.

### SELECTION BASED ON FEASIBILITY

"There is a widespread belief that the selection of new projects is largely governed by personal considerations. It needs to be made clear that this is not true. In addition, there is much to be gained by a coordinated and carefully thought out program of development, the preparation of which would be participated in by Congress, this department, and the Bureau of the Budget. Such a program, when adopted, should be adhered to until changed by congressional authority.

"If such action impresses you as judicious, it is suggested that you communicate with the Senate and House and request that a special joint committee be appointed, consisting of the chairman of the Senate and House Committees on Irrigation and Reclamation, the chairman of the Committees on Appropriations of the Senate and House, the Director of the Bureau of the Budget, and the Secretary of the Interior, to work out a scheme of future construction for the purpose of keeping within safe limits the amount of expenditures for the next 10 years.



"Such a program, if adopted, could be modified in details from year to year, but it would furnish valuable information for the public, relieve this bureau from continued pressure, and make development more economical and efficient.

"Attached hereto is a copy of the Annual Report of the Bureau of Reclamation for 1924, above referred to, and a list of additional projects or divisions of projects for which appropriations have been solicited."

The following is the list of projects for which appropriations are asked, not included in the tentative program of future work in the Twenty-third Annual Report of the Bureau of Reclamation:

Project	Estimated cost
Trinity River, Tex. ....	( <sup>1</sup> )
Red Bluff, Tex. (S. 2321).....	\$3,000,000
Alamogordo, N. Mex. (Carlsbad).....	2,000,000
Rio Grande (Albuquerque).....	( <sup>1</sup> )
Butte and Deer Creek, Calif.:	
Deer Creek.....	3,151,180
Butte.....	5,368,880
Orland (Stony Gorge).....	1,485,000
Westland irrigation district, Oreg.....	600,000
Stanfield irrigation district, Oreg.....	300,000
Stanfield extension.....	300,000
Mathew-Okanogan.....	4,400,000
Washington district.....	1,000,000
Gooding irrigation district.....	6,000,000
Casper-Alcova, Wyo.....	13,500,000
Saragoga, Wyo.....	2,560,000
Lonesome Prairie irrigation project, Mont.....	

### SENATOR McNARY'S REPLY

In a letter to Secretary Work, Senator Charles L. McNary, chairman of the Senate Committee on Irrigation and Reclamation, declined to accept the proposal of the Secretary on the ground that he did not deem the course of action wise because it would divide responsibility and would result in decentralizing authority in the selection of new projects when centralization of authority is needed to meet the excessive demands on the reclamation fund. The Senator's letter in full follows:

"Before me I have your recent letter stating that the demands upon the reclamation fund for the construction of new projects far exceed sums that will be available for a considerable period of time and suggesting that I communicate with the Senate and House and request that a special joint committee be appointed, consisting of the chairmen of the Senate and House Committees on Irrigation and Reclamation, the chairmen of the Committees on Appropriations of the Senate and House, the Director of the Bureau of the Budget, and the Secretary of the Interior, to work out a scheme of future construction for the purpose of keeping within safe limits the amount of expenditures for the next 10 years."

<sup>1</sup> No estimate.

## Judging a Project's Feasibility

By R. E. Shepherd, manager, Twin Falls North Side Land & Water Co.

**T**HERE are certain questions that must be satisfactorily answered before any project should be undertaken.

The order in which I shall present these questions does not signify their relative importance, as I believe if any project will not at the time stand up under all of them it should be let alone until such time as it will. It will be observed that some of these questions go to the very vitals of an irrigation project, while others relate to the time of the undertaking. Changed conditions may make desirable in the future that which would now be unprofitable. Satisfactory answers should be required and proof offered as to each of the following questions. If doubt exists as to any one, time should be taken to clear it up.

1. Is the land to be reclaimed sufficiently fertile and its soil structure such as to produce valuable crops for an indefinite period without resort to excessive cost for fertilization?

2. Is the surface of the land such as to permit of its irrigation without too great expense, having due regard to the class of major crops that it is adapted for?

3. Can the land be readily drained at reasonable cost, so as to prevent its becoming swampy or alkali, after repeated irrigation?

4. Is there an adequate supply of water available within a reasonable distance

sufficient at all times to supply all of the and in the project with the amount required to produce profitable crops?

5. Can this water be diverted for this purpose through a canal system that can not only be built within reasonable cost limits, but can thereafter be operated and maintained without excessive expense?

6. Is the project so located with reference to transportation and markets as to offer an incentive for its farm development?

7. Is there a present market demand for the products for which such land is naturally adapted, that under ordinary conditions would make the use of such land profitable to a farmer of ordinary ability and means?

8. Will the entire cost of the work, including time required to secure settlement on the land, plus a reasonable profit, when spread over the entire area be such that the acre cost to the farmer, including the original cost of the land and its improvement by him, compare favorably with the cost of a farm in the humid sections, having due regard to character of crops, yield, and cost of production?

9. Is the project so financed as to the farmer that it will attract the man of limited means to locate thereon with assurance that he can succeed and meet his obligations promptly?

"You ask me to take this action in the event it appears to be judicious. I regret, Mr. Secretary, to advise you that I do not believe this course of action wise. It would simply divide responsibility now wholly residing in you into as many human units as six is divisible by one, thereby passing the ultimate responsibility around in a circle without a beginning or an end. I feel that such a plan would work for decentralization when centralization of authority is greatly needed to meet the excessive demands on the reclamation fund, particularly when the only reservoir of information of the worthiness of the proposed projects is found in your department, the Bureau of Reclamation, and your chosen soil experts, engineers, and economists.

"The laws provide that you may examine into the merits of projects pressing for development and if convinced of their feasibility, transmit your approval with estimates of costs to the Director of the Bureau of the Budget, who, if satisfied the costs do not conflict with the economy

program, will submit the estimates to the President. Meeting with the President's approval, the estimates are transmitted to Congress for appropriate action.

"The procedure here briefly sketched affords sufficient safeguards against wasting any portion of the reclamation fund on infeasible projects.

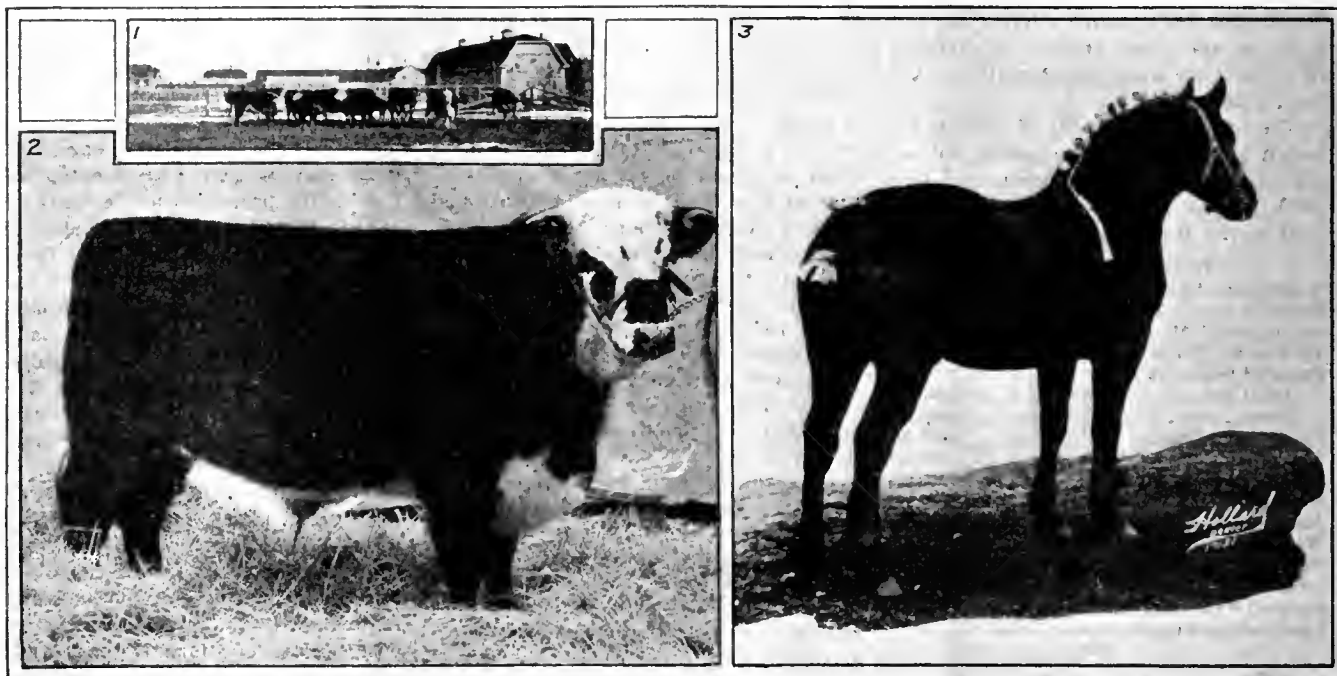
"The present plan and practice of committing to the Secretary of the Interior the responsibility of initiating the consideration of new projects and their construction, in my judgment, should not be substituted by your proposal, however hopeful you may be as to its excellence and desirability.

"In disapproving of your proposal, I must not be understood as being desirous of retreating from any responsibility placed upon me as chairman of the Senate Committee on Irrigation and Reclamation, as in such a capacity at all times you may be assured of my anxiety to cooperate with you in carrying out successfully this great work of development through reclamation."

## Livestock Improvement at University of Wyoming

*The degree of improvement will depend upon the use of well-bred purebred sires; a rigid policy of culling females; and practicing approved and common-sense methods of feeding and care*

*By Prof. Fred S. Hultz, head of Animal Husbandry Department*



1. The University of Wyoming Hereford herd. 2. Champion Shorthorn steer at the 1926 National Western Stock Show. He was bred, fed, and exhibited by the University of Wyoming. 3. Grand champion Percheron mare at the 1926 National Western Stock Show. Owned and exhibited by the University of Wyoming

MUCH has been written about the importance of maintaining well-bred livestock on farms. Whether the farms are situated on a western reclamation project or are located in the heart of the Corn Belt, well-bred livestock will continue to play a most important rôle in their success. I purposely use the term "well bred" instead of "purebred." Purebred means just one thing—that a careful record of an animal's ancestry has been kept and recorded. Fortunately most purebreds are well bred, and most of our progress with domesticated animals has been with purebred stock. However, the fact of pure-bredness is not alone sufficient, because a high type of individual excellence should accompany every pedigree. The animal in question must be a good individual as well as have good ancestors.

It is not my purpose to belittle the purebred. Agricultural literature is full of proof that we must cling to the purebred for our livestock salvation. A known record of ancestry, commonly called a pedigree, should, and usually does, mean that careful thought has been given to the matings which appear in that pedigree.

Each breed represents the ideal of a group of breeders, and the families in that breed represent the ideals of a smaller group of breeders. If the ideals of a certain breeder are known to be high, then that breeder's name on the pedigree means a great deal.

We know that offspring tend to resemble their parents; that is heredity. We also know of another force called variation; which causes offspring to resemble some of the ancestors further back in their family tree. It is variation which necessitates careful selection of all breeding stock, whether purebred or not. By selecting only good ones for breeding purposes we stand a better chance of getting good offspring.

The ability to recognize worth by examining an animal is called livestock judging. This ability is acquired tediously through long and varied experience, or more quickly by taking courses at the State agricultural colleges. It forms the very basis for success with livestock, as without the knowledge of what constitutes a good animal no one can intelligently buy, sell, feed, or breed animals.

### THE THREE ESSENTIALS

A good pedigree, careful selection of the individual, and the right kind of care are the three essentials to livestock improvement. The best purebred will look like a scrub if not properly fed, and then no one can tell by his appearance if he is a good one or not. Heredity forms the skeleton, but the feed pail puts in the outlines. We can not spare the feed pail and hope to attain success in the development of the animal.

Dr. Mead has suggested that the readers of the RECLAMATION ERA might be interested in knowing what is being done toward livestock improvement at the University of Wyoming. Herds of Hereford, Shorthorn, Holstein, and Guernsey cattle, Percheron horses, Duroc-Jersey, Tamworth and Poland-China hogs, and flocks of Rambouillet, Hampshire, Corriedale, Lincoln, Oxford, and Southdown sheep are maintained at our farm, as well as several breeds of poultry. These animals are kept primarily for classroom instruction, but also one of the functions of an agricultural college is to assist stockmen in securing better livestock.

The quickest and cheapest way of accomplishing this is to produce good animals on our own State farm. We use only purebred, registered stock for breeding purposes, practice a rigid policy of selecting only the best for retention in the herds, and feed young stock adequately so as to be insured of their maximum growth and development. Many of these fine young animals have been sold out over the State to breeders, farmers, and ranchmen and have thus assisted in livestock improvement.

#### SPECIAL PROBLEMS OF THE STATE

Wyoming's system of animal production differs from that of most other States. Due to our climate, geographical location, wide variation in altitude, and distance from the great market centers, we are confronted with problems not common to other sections.

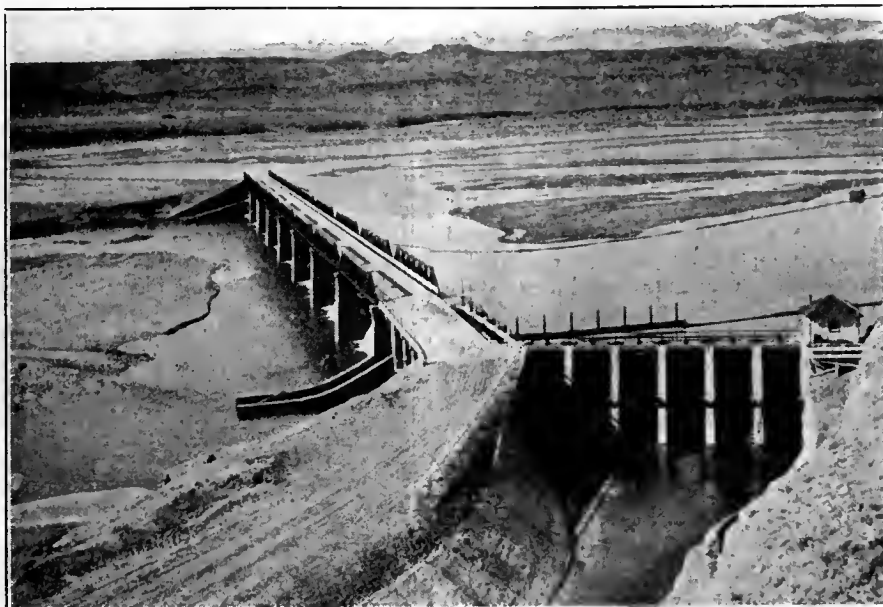
Many changes in production methods in recent years have presented an imperative need for experimental investigation. A few of the livestock projects now under way at the University of Wyoming are fattening beef calves, feeds for wintering range ewes, Wyoming feeds for producing pigs, dairy-cattle feeding, incubating chicks at high altitudes, and rations for egg production in Wyoming.

Any policy of improvement must look toward the future. There has never been a time when high-class meat animals received a higher premium for being high-class than now. It takes an exceptionally good steer to market as fat beef at 12 to 18 months of age, and a fine lamb to make a choice 40-pound carcass. Almost any fair steer can be made fat and marketable in two or three years, but the housewife is demanding handy-weight cuts of meat and these come only from young beef and lamb. The reduced export demand is also a factor in making the market requirement what it is. We no longer have much demand from Europe for heavy beef carcasses. Occasionally a load of well-fatted 3-year-old steers will sell well on the market to go toward supplying the fancy hotel or restaurant trade, but this demand is comparatively limited. To secure a top price on the market, steers must class as baby beef. This class, as was pointed out above, can be produced only from well-bred, typey, early maturing calves of a highly improved sort.

#### FACTORS FOR SUCCESS

Regardless of whether your object is the production of feeder stock, finished meat, dairy products, or poultry, your success will depend upon the degree of improvement accomplished with your herds and flocks. I will say that the

## Land Opening on Riverton Project, Wyo.



The Wind River diversion dam on the Riverton project, Wyo.

**E**ARLY in this month 20 irrigable farm units on the Riverton project, Wyoming, will be opened to entry under the new regulations providing for the selection of settlers on the basis of approved qualifications of industry, experience, character, and capital.

The irrigable area of the farms ranges from 35 to 108 acres, averaging about 75 acres. Water for their irrigation will be available during the coming season.

Until July 1, 1926, the farms will be open to entry only by ex-service men who served in the United States Army or Navy in the World War and have been honorably discharged or placed in the Regular Army or Naval Reserves, provided that they are qualified to make entry under the homestead laws. After that date any remaining farms may be filed on by any qualified person.

Applicants will be passed on by an examining board and will be selected in accordance with the regulations of the department. Each applicant must have had at least two years' experience in farming and must have \$2,000 in money

free of liability, or the equivalent in livestock, farming equipment, or other assets.

Irrigation water will be furnished the successful applicants during the seasons of 1926, 1927, and 1928 for a minimum advance payment charge of \$1 per acre for 2 acre-feet, with additional water at the rate of 50 cents per acre-foot. As these lands were originally part of the Wind River, or Shoshone Indian Reservation, the entryman must pay, in addition to the reclamation charges, \$1.50 per acre, of which 50 cents must be paid on the date of entry, and 25 cents per acre per year for each of four years thereafter. The construction charges on the land will be announced later.

Full information concerning the opening, together with the farm application blank which must be filed by each applicant, may be obtained from the superintendent of the Riverton project, Riverton, Wyo., from the Commissioner of Reclamation, Washington, D. C., or from the chief engineer, Bureau of Reclamation, Wilda Building, Denver, Colo.

degree of your improvement depends upon:

1. The use of well-bred purebred sires, carefully selected as individuals.
2. A rigid policy of culling females for retention in the breeding herd.
3. Practicing approved and common-sense methods of feeding and care, par-

ticularly as regards adequate development of young stock.

Your State agricultural colleges are anxious to assist you in every way possible. Their doors are always open to boys and girls who wish to study the livestock industry and thereby become more proficient in livestock improvement

## Women on the Projects and Their Relation to Better Agriculture

*The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life*

*By Mae A. Schnurr, secretary to the Commissioner and Associate Editor, New Reclamation Era*

THE old days are gone forever. Now when a man decides to take up a farm unit on a Federal irrigation project, he doesn't do all the questioning of the local officials of the Government. He is presented with a form of application which is designed to bring out the facts showing whether he possesses sufficient capital, experience, and is surrounded with other favorable conditions which have been found to be desirable.

Recognition of the importance of the woman's part in this great undertaking of establishing a home upon the land is mutely acknowledged in this question in the bureau's form of application:

"If married man, what experience has your wife had in farm life?"

Experience has proven that this factor is not to be underestimated, and that a farmer's ambition to become successful may be helped materially by marrying a girl brought up on the farm. Town-bred women are less likely to be contented.

In discussing the form of application and the above-quoted question in particular, the commissioner unwittingly formed the basis of this article when he said:

"That question is far more important than many others on our questionnaire. I knew four successful farmers on one project to quit their farms merely because they had married town girls."

The farmer's wife is responsible primarily for the well-being of the family, and as her main sphere, the management of the house. To this sometimes is added care of the poultry yard and garden. The woman's share in planning the farm work may sensibly increase the gross yield, and the net profit may also be larger in consequence of her excellent administration of her trust; and thus the economic basis of the family may be strengthened.

### *Economy versus Efficiency*

Nine women out of ten believe themselves thrifty and economical when they "wear out" their old, run-down, misshapen shoes "round the house" where few notice what they have on, and many tasks inevitably dim the shine and spoil the appearance of any shoes. The tenth housekeeper perhaps realizes that when she wears comfortable, well-fitted shoes with broad, low heels and roomy toes, at her work, she can get through the



Miss Mae A. Schnurr, associate editor in charge of the women's section

day without a backache or tired feet, that she can stand straighter and for a longer time if necessary, and, in fact, be generally more efficient.

In California the home demonstration agents have been conducting active campaigns in 12 counties during the past year to convince farm women of these facts, and to show them how to select their own and their children's shoes properly. Most of these rural mothers and housekeepers are keenly interested in seeing the shoes they happen to be wearing at the meeting where the subject is introduced, and in comparing their footwear with the types of good-health shoes exhibited by the extension worker who addresses them.

A report received by the United States Department of Agriculture states that as a result of these campaigns dealers are willingly cooperating with the home demonstration agents, lending models of approved shoes, instructing people in taking correct foot tracings and measurements, and providing more careful service in fitting shoes at the local stores.

Talks on foot hygiene are supplemented by such illustrated material as slides, X-ray pictures, photographs of good and bad choice of shoes, and the ills resulting from wearing the wrong kinds. Foot exercises for strengthening muscles and arches are demonstrated. It is also shown that stockings must be properly fitted and that garters should not restrict circulation.

### *Better Kitchens—A Woman's Delight*

One of the first things the home maker thinks about in a better home is a well-arranged, well-equipped kitchen. That does not mean that she is kitchen-minded either. It means rather that she knows where convenience counts most in a house. In most family kitchens at least 1,000 meals are cooked during the course of every year. Surely for any job that comes as regularly and often as getting three meals a day, every step-saving, time-saving arrangement possible should be included in the plan and the equipment.

The points that make for convenience in the kitchen are as follows, according to the Bureau of Home Economics:

First, last, and all the time in planning and equipping a kitchen, says the bureau, think about the work to be done in it.

If building or remodeling a kitchen, make it oblong and with no more floor space than actually needed. A kitchen is a workroom. Spaciousness is paid for in miles of useless steps.

Study the relation of the kitchen to the rest of the house. Make a direct connection from kitchen to dining room in the common wall between them. See to it also that there is easy access to front and back doors, to the telephone, and to the stairs to the cellar and the second floor.

Arrange for adequate ventilation in all weathers and for good lighting at all work centers at night as well as during the day.

Screen windows and doors against household pests. Flies particularly are a menace to health.

Choose finishes for floor, walls, and woodwork that are durable, suitable in color, and can be kept clean easily.

Select furnishings that fit the wall and floor space and they will pay for themselves in usefulness. Weigh the pros and cons of built-in or movable pieces and compare prices carefully.

Make sure that there is an abundant supply of hot and cold running water and a sanitary drainage system.

Decide on the most comfortable height of working surfaces.

Group all equipment, large and small, into compact work centers for preparation of raw food, cooking, serving, clearing away and dishwashing, and any other activities done regularly and often in the kitchen.



The kitchen is above all else a place to prepare and serve food. Limit the kitchen to this use, if possible, and arrange for laundering and such work to be done in another place.

A breakfast alcove built in one end of the kitchen not only adds to the kitchen's appearance but saves the housewife many steps and keeps the work in one room for at least one meal.

### *Felt for Chair Legs*

Felt glued on the ends of chair legs will prevent them from marring the polished floor. Also this simple device will do away with the scraping noise chairs generally make when moved about. There are rubber caps manufactured for this purpose, but the felt will be found easier to attach, as it can be cut to any size. Long strips also can be cut to fit the rockers of rocking chairs.



A home on the Minidoka project, Idaho

## *Rural Homes on the Minidoka Project*

*By Mrs. R. S. Moy, of Rupert, Idaho*

**T**HERE are about 2,500 farm homes within the boundaries of our Minidoka project, Idaho. Approximately 50 per cent of these homes are equipped with electricity and convenient water systems.

The greater proportion of these homes are substantial in structure, many of different new types of brick, some of cement, and many of first-quality weather lumber. Because all homes are comparatively new it is quite an attractive spectacle to visitors to see so many substantial, well-painted buildings erected in the short span of scarcely 20 years.

However, there are real vital factors in this environment that cause home making and settling to be very desirable, because of the natural advantages here for a home and for the family.

With the availability and small cost of electricity, the work of the housewife is lessened materially. Upon survey we find a large percentage of our home makers using electric milk separators, electric flat-irons, electric washers, electric hot plates, electric curling irons, electric percolators, electric warming pads, electric water heaters, toasters, ranges, and waffle irons.

With the great development of poultry and dairy production which we have here, the housewife's work is made much easier with these mechanical aids because naturally poultry, milk, cream, and butter

disposal can be handled by men of the household more readily if they have electric equipment to work with. This eliminates a great amount of work from the housewife's budget, allowing her more time for cultural privileges and the beautifying of her home to which, as a rule, the farmer's wife can give so little attention.

But this type of material development is not the only advantage. We find hand in hand with it the finest progress in those factors which build for future citizenship. The auxiliary agencies of

schools, churches, and libraries are highly developed because of the very fine leadership available on a new project through helpful agencies. This has meant rapid, substantial, and well-founded development which easily parallels that on any older project in this or any other State.

### *Try This*

SUE'S FUDGE CAKE

<p>½ cup butter or margarine. 1 cup sugar. 2 cups pastry flour. 1 cup buttermilk. 1 well-beaten egg.</p>	<p>2 squares chocolate melted over hot water. 1 teaspoon salt. ½ teaspoon soda. 1 teaspoon baking powder. 1 teaspoon vanilla.</p>
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Cream butter and sugar, add egg and chocolate. Add flour, baking powder, soda, and salt, sifted together—alternately with milk. Flavor with vanilla. Pour in greased pan and bake at 350° F. Frost.

### *Appreciation*

Mrs. Moy has furnished the first article for the women's section, and I hope others will follow in sufficient numbers to publish one or more in each issue.

An account of the ideas, plans, and personal experiences of the women and children on the projects is bound to make interesting reading for others. In return for the contributions you make of material for this section I pledge to you hours of research every month into the things I believe will interest my readers. My compensation will be appreciation and the knowledge that what I present in this section is read by many.—M. A. S.

## *Project Women Urged to Share Their Domestic Science Secrets*

*We will print in the ERA all recipes, with credit to authors; also any good household hints.*

*We will also be glad to print from time to time in the women's section accounts of personal experiences of our project women in their work of helping to make homes in the arid region.*

*Let us hear from you.*



## Uncompahgre Project Lamb and Cattle Feeding Tours

*An interesting account of how farmers on the project are utilizing the by-products of the sugar-beet crop and of sugar manufacturing.— These tours should result in more finishing of stock and improved feeding methods*

*By H. A. Ireland, County Extension Agent, Montrose County, Colo.*

**F**OLLOWING the introduction of sugar-beet growing on the Uncompahgre project, Colorado, came an interest in the feeding of lambs and cattle on the by-products of the crop and of sugar manufacture. With the rapid increase of this interest there was a need for more definite information, applicable to local conditions, regarding feeding methods, equipment, expected gains, costs of gains, etc. That men feeding or planning to feed cattle or lambs might be brought together for the discussion of these and other questions, and to review the results of experimental feeding of beet by-products, two tours were planned and have been held, one for lamb feeders in December and one for cattle feeders in February. Both were widely advertised through meetings, local papers, and circular letters addressed to all sugar-beet growers of Montrose and Delta Counties, and both were fairly well attended. The interest manifested by those on the tour and attending the meetings held in connection with the tours was very good.

### WHAT THE LAMBS WERE FED

The lamb feeders' tour was held on December 15 and 16. Starting from Delta at 10 o'clock a. m. on the 15th visits were made to the feed yards of the following men: Alfred Smith, where 600 lambs from Utah were being fed on beet tops, pastured in the fields, and alfalfa. These averaged 70½ pounds at loading point and were received October 1.

W. P. Dale had elected to run a small band of 600 head of aged ewes, breeding them as early as he could after buying the ewes and getting them down from the range, with the idea of making an early market lamb and of feeding both ewes and lambs together. The ewes were on stubble fields with some alfalfa pasture and beet tops and were looking good. The demand for old ewes has been greater than the supply.

Mr. McConnell was feeding a small bunch of lambs in dry lots, on hay, beet tops hauled in, and squash, and apparently making a satisfactory gain in weight.

### FEEDING BEET PULP

After a trip through the feed yards of the Holly Sugar Co. where several hundred cattle were being fattened on beet pulp and hay, and following a lunch provided by some of the larger-hearted lamb

feeders of Delta, in the community rooms, the tour continued to the farm of Scott Bros., one of the larger operators, where another band was seen pasturing in the beet fields with hay fed in panels in the field. Across the road B. C. Marchbanks had 1,200 head on beet-tops pasture and was feeding hay in corrals at night with some beet pulp. M. H. Patnode, an old cattle feeder, had put in 2,100 lambs which had been fed tops and hay in large corrals till the tops were gone, when pulp had been substituted with a small amount of molasses and later a little barley. Ford Sayre was feeding 600, hauling beet tops from the field, and feeding hay in panels.

A meeting was held in connection with the Lions Club luncheon in Delta in the evening at which E. J. Maynard, in charge of feeding investigations of the Colorado Agricultural Experiment Station, Ralph Mahon, general livestock agent of the Denver & Rio Grande Western Railroad, and L. M. Pexton, traffic manager for the Denver Union Stock Yards, were present and discussed various problems with feeders and shippers.

The second day's tour was similar to that of the first, starting from Montrose and including stops at the farms of the Holly Sugar Corporation, where 120 head of steers were being fed in corrals as a test on hay and beet tops: N. E. Marchbanks, where 847 lambs were feeding on beet tops, hay, and ear corn: F. W. Vernon, who was feeding 1,500 lambs on alfalfa and stock beets grown for that purpose; C. W. McLaughlin, who had 2,000 head on tops in the field, and hay; and M. H. Patnode, who was visited the first day. A meeting was held in Olathe, at the high school at noon.

Some of the stock inspected was owned by the feeders, some was being fed on contract. No definite information could be gained at the time, but the purpose of the tour was to give feeders and prospective feeders an opportunity to note the rations used on different farms, compare the stock, and then in the meetings hear rations and feeding methods discussed by a man with wide experience in experimental feeding.

About 150 persons attended the two meetings held, most of these also going on the tour. Mr. Maynard states that the affair compared favorably in all respects with the annual tour held in the lamb-feeding section of northern Colorado.

### VARIETIES OF CATTLE FEED

On February 10 a cattle feeders' tour similar in plan and purpose to the tours of January 15 and 16, was held on the project. Cattle feeding is less popular than lamb feeding at this particular time and it was necessary to include feeders of both counties in one tour to fill the day. The following is a statement of farms visited and stock and methods inspected:

Harry Hoover was feeding 111 head of yearling Herefords on corn, silage, and alfalfa; Elmer Smith had 50 head of short 2-year-old Hereford steers on silage, alfalfa hay, and cottonseed cake, to which he planned to add some beet molasses after seeing results of experiments with rations similar to the one he was using; John Boyden was feeding some calves and cows on silage, alfalfa, and molasses; Alfred Smith had 100 head of baby beeves on alfalfa, beet pulp, molasses, cottonseed cake, and a small amount of oats, which with the grain eliminated is considered the ideal ration for beet-growing sections from the standpoints of both efficiency and economy; E. J. Hatcher had 110 head of yearlings on alfalfa, pulp, and corn; Hallock Bros. had a somewhat mixed bunch of steers and heifers on alfalfa, pulp, and corn silage; and W. W. Newton was feeding a choice bunch of 28 2-year-olds on alfalfa and corn silage. B. W. Fairbanks, State livestock specialist, commented on the rations used at each stop, and at a meeting held in Delta in the evening led a general discussion of rations and feeding methods. A total of about 70 persons attended the tour, the greatest number present at any one farm being 55. Everyone present seemed to feel well repaid for the time spent.

More finishing of stock for market and a general improvement in rations and feeding methods are the results hoped for from the tours.

Revision of the Government's reclamation policy is expected to give a new impetus never before known to the reclaiming of arid and semiarid land.

The proposed Colorado River development will be one of the greatest engineering undertakings ever attempted by the Government.

# Law Notes of Interest to the Irrigationist

Submitted by the district counsel and others

## CONDEMNATION IN TEXAS

THE Government brought suit to condemn land for the Tornillo Canal in the Texas division of the Rio Grande Federal irrigation project. The defendant landowners asked that the suit be dismissed on the ground that the law extending Federal irrigation to Texas is unconstitutional, there never having been any public lands in that state. Delays in the suit caused the Bureau of Reclamation to change the course of the canal and utilize other lands. Those described in the suit being no longer needed, the United States moved to dismiss the case. The defendants contested this motion, alleging that the construction of the Tornillo Canal had damaged them to the extent of \$20,000, and asking for judgment in that amount. The Government's motion being allowed, the defendants appealed to the circuit court of appeals. In *Owen et al. v. United States* (8 Fed. (2d) 992) the appellate court sustained the decision of the lower court, holding that the Government may dismiss a condemnation proceeding at any time before there is a taking of property which vests right to compensation, that the Government can not be sued without its consent, and that defendants cross-claim, being in excess of \$10,000 was not within the jurisdiction of the district court.—O. H.

## WARREN ACT WATER RIGHTS TAXABLE

The Northside Canal Co. (Ltd.), an Idaho corporation, has a contract with the United States, authorized by the Warren Act of February 21, 1911 (36 Stat. 925), which provides for a water supply for that company from the Jackson Lake Reservoir of the Minidoka Federal irrigation project. The reservoir is in the State of Wyoming and the lands irrigated by the water are in Idaho. The taxing officials of Wyoming sought to tax the "equity or water rights in Jackson Lake Reservoir" held by the company, and suit was brought by the company in Federal court to enjoin the assessment and collection of such taxes. The United States intervened, asking the same relief. In *Northside Canal Co. (Ltd.) v. State Board of Equalization et al.* (8 Fed. (2d) 739) it was held that the rights of the plaintiff in the reservoir are taxable in Wyoming; that this is not the taxation of Federal property; that such taxes are not invalid on the ground that they tend to make Government contracts under the

Warren Act less desirable; and that the fact that the legal title to the reservoir is in the United States is immaterial. An appeal has been taken and is now pending.—O. H.

## FEDERAL VERSUS STATE WATER LAW

S. Clare Mower, a farmer on the Boise Federal irrigation project in Idaho, brought suit to enjoin J. B. Bond, the project superintendent, from cutting off his water supply because of delinquency for more than a calendar year in the payment of an operation and maintenance charge. The procedure proposed by the project superintendent was in accordance with Federal law but alleged to be contrary to State law, which the plaintiff contended should apply. This contention by the plaintiff was denied by the court in *Mower v. Bond* (8 Fed. (2d) 518).—O. H.

## The Water Supply On the Projects

Water supply conditions on the projects at the end of February were as follows: Prospects for additional storage and natural flow were above average on the Belle Fourche, North Platte, and Orland projects; average on the Carlsbad, Strawberry Valley, and Umatilla projects; average for Minidoka, as to additional storage, and for Grand Valley and Uncompahgre as to natural flow. On the Boise, Klamath, Milk River, Minidoka (Jackson Lake), Newlands, Okanogan, Rio Grande, Sun River, and Yakima projects the prospects were below average, and on the Salt River project the prospects were very poor. The Huntley, King Hill, Lower Yellowstone, and Yuma projects, which are without storage, are assured of full water supply from natural sources. The Riverton and Shoshone projects, which have storage, are assured of full water supply for present development. Since January, conditions have improved on the Newlands, Okanogan, Orland, Strawberry Valley, and Umatilla projects, while the prospects are less favorable on the Milk River and Sun River projects.

## FIRST DEFICIENCY ACT, 1926

(Extracts from.) An Act Making appropriations to supply urgent deficiencies in certain appropriations for the fiscal year ending June 30, 1926, and prior fiscal years, to provide urgent supplemental appropriations for the fiscal years ending June 30, 1926, and June 30, 1927, and for other purposes. (Approved March 3, 1926, 44 Stat. —.)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, to supply urgent deficiencies in certain appropriations for the fiscal year ending June 30, 1926, and prior fiscal years, to provide urgent supplemental appropriations for the fiscal years ending June 30, 1926, and June 30, 1927, and for other purposes, namely: \* \* \*

### Bureau of Reclamation

North Platte project, Nebraska-Wyoming: For continuation of construction and incidental operations, including the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1926, \$300,000, to remain available until June 30, 1927, and to be paid out of the "reclamation fund."

Yakima project (Kittitas division), Washington: For continuation of construction and incidental operations, including the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1926, \$2,000,000, to remain available until June 30, 1927, and to be paid out of the "reclamation fund." \* \* \*

### Judgments of United States courts

For payment of judgment rendered against the United States by the United States District Court for the District of Wyoming, on September 2, 1925, in favor of the Bothwell Co., in condemnation proceedings under section 7 of the act of June 17, 1902 (32 Stat. 388), for the acquisition of lands for the Pathfinder Reservoir, \$9,600, together with interest thereon at 8 per cent per annum from July 3, 1909, to and including February 19, 1923, and at 7 per cent per annum from February 20, 1923, until the date of payment, payable from the "reclamation fund" created by said act.

None of the judgments contained herein shall be paid until the right of appeal shall have expired. \* \* \*

## Washington Irrigation Institute Adopts Irrigation Resolutions

At its annual meeting, held on February 11 and 12, the Washington Irrigation Institute adopted, among others, the following resolutions relating to irrigation:

*Resolved*, That reclamation by irrigation is an important factor in American agriculture with an increasing influence in the economic production of an adequate national food supply. Although some mistakes have been made in both national and private projects, these are now serv-

ing as a preventative of their repetition on future projects.

*Resolved*, That with the new era in the organization, selection, and administration of reclamation projects which include soil, adequate water supply, and a market for the products of the soil, the settler will have a reasonable opportunity for success; and the State being benefited greatly by the increase in property values, Washington Irrigation Institute favors a policy of

cooperation between the Federal Government and the State or irrigation district or a local land-settlement corporation in procuring settlers for reclamation projects created by Federal appropriations.

*Resolved*, That we believe that the State of Washington is fundamentally interested in irrigation and reclamation and should adopt a reasonable State policy. The legislature has created a commission to investigate and report at its next session upon the whole question of State reclamation and upon a policy for future procedure. It is, therefore, recommended by Washington Irrigation Institute, that the president appoint a committee of three members to conduct an independent study and cooperate with such legislative commission, if deemed advisable, and report its findings to this institute prior to the next session of the State legislature.

## Alkali Soil and Its Reclamation

By C. C. Wright, specialist in irrigation investigations, State College of Washington

CERTAIN areas on practically all irrigation projects have been damaged by the accumulation of alkali in the surface layers of the soil. The extent of these areas and damage, varies from a few acres where partial crop production is possible to large tracts thousands of acres in extent, where scarcely any crop plants can be grown. This accumulation of alkali in one place or another, usually in the lower lands of irrigated projects, seems almost inevitable under our present irrigation methods and practices. In the future it may look just as foolish to build an irrigation system without its accompanying drainage system as it would look now to put in a city water system without a sewer.

Hundreds of thousands of dollars are being spent in the Western States every year in the reclamation and attempted reclamation of alkali lands, while thousands of acres more are "going bad" each year. Hence the prevention of alkali land bears the same relationship to its reclamation as the prevention of diabetes or influenza bears to its treatment and cure. And there are just as many disappointments in trying to reclaim alkali land as there are in trying to cure diabetes or the flu.

Excessive accumulation of alkali salts in the soil is invariably associated or has been associated with inadequate drainage and a resulting high groundwater table of relatively salty water. The soil blanket above the water acts like a wick in that it absorbs the water with dissolved salt at its lower side and loses water by evaporation from its sur-

face, the salts being deposited at the place of evaporation.

Most crop plants will not tolerate a concentration of salt in the soil solution much above 1.5 per cent. This means that in order to be safe for crop production the salt content of the soil should be rather less than 0.5 per cent. When the soil contains this amount of alkali the first consideration in its reclamation must be to in some way get rid of the excess salt. Little or nothing can be accomplished by trying to grow crops which are especially tolerant of alkali, such as sweet clover or some of the salt grasses

## Boards Appointed To Select Settlers

Additional boards of examiners to select settlers have been appointed on the following projects:

*Sun River project, Montana.*—G. O. Sanford, superintendent, Fairfield, R. L. Clarkson, Choteau; Henry Radcliffe, Fairfield.

*North Platte project, Nebraska-Wyoming.*—H. W. Bashore, superintendent; Mitchell, Nebr.; Henry M. Springer, Mitchell; Royce F. Tebbet, Torrington, Wyo.

*Rio Grande project, New Mexico-Texas.*—L. M. Lawson, superintendent, El Paso; F. J. Rigney, jr., Las Cruces, N. Mex.; H. L. Kent, State College, N. Mex.

*Riverton, Wyo.*—H. D. Comstock, superintendent, Riverton; J. J. Jewett, Riverton; P. B. Dykeman, Riverton.

which are used for pasture, until the excess salt has been removed. There is only one method known for the reclamation of alkali soil. That method is to reverse the process by which the salt has been deposited. The salt was brought into the soil by the upward movement of water to replace evaporation loss. If the soil is to be reclaimed that salt must be moved downward through the subsoil by heavy irrigation and carried away by drains.

The removal of this excess salt, however, is not always accomplished by simple drainage. Certain types of alkali soils will not become normal or productive by merely removing the soluble or "washable" salts which so often has been assumed in reclamation practice, but the replaceable sodium, which is held in combination with the soil or absorbed by it, must also be displaced. Experiments are now in progress on certain alkali lands in different parts of the country to determine the best methods of accomplishing this result. Present indications are that applications of gypsum or sulphur, either alone or with manure, will be a necessary part of the procedure.

But by properly sampling the soil of an alkali area and subjecting these samples to chemical analysis it is now possible to tell whether the area can be fully reclaimed by drainage alone or whether it will need special chemical treatment in addition. In case such special treatment is necessary it is not easy to tell what the cost will be or what will be the rate of reclamation. These, along with many others, are questions to be answered by future experiment.

In future relief will be granted only to individual farmers who furnish satisfactory proof of inability to meet charges.

## Operation by the Water Users

*From "The Gazette," Reno, Nev., February 11, 1926*

**T**HE sooner the settlers upon Federal irrigation projects take over their operation and maintenance, which is being seriously considered by those upon the Newlands project, the sooner they will bring their affairs to a proper business basis and remove themselves from the depressing influences which have attended prolonged Federal operation.

Not only Secretary Work and Commissioner Mead, but the Fact-Finding Commission which conducted extensive investigations two years ago, went far beyond immediate consideration of the Government's financial interests when they urged that such steps be taken. In reality they were primarily influenced by the welfare of the settlers themselves when they advised them to stand upon their own feet and become the actual and active owners and operators of the works which the Government had built for their benefit.

As excellent authorities upon reclamation have pointed out, it was never

intended by Congress, when it enacted the reclamation law, that the Federal Government should remain the operator of any project for an extended length of time after bringing its lands to a productive basis. The entire theory of the act was that the Government would finance the construction of the works and then surrender them to the settlers who would repay the cost and operate them as their own property under restrictions which would insure proper maintenance. It was never meant that Government operators should remain forever upon the ground and that the settlers should be placed in the same category as Indians upon reservations.

It would be incorrect and ungrateful, however, to belittle the fostering efforts which have been put forward by the Government upon behalf of the settlers. In fact, it has been more than generous. True, it has made mistakes, costly ones, but on the other hand it stands ready to cancel the charges in all such instances.

It has frequently postponed the collection of operation charges when no such postponements would have been allowed by a privately owned irrigation district or a banking corporation. And its leniency, it truthfully may be said, has not infrequently been abused by demands, which have been conceded, for wholesale moratoriums and large cancellations.

In every instance the best interests of both the Government and of the settlers will best be served by the latter taking over completely project operation and maintenance. Before this can be done, of course, there must be a clear definition of the repayment charges to be undertaken by the settlers, a clear limitation upon project areas, and an understanding that the Government will complete storage and other works not yet finished. To such a plan the Government is agreed.

The owners of the project farms will then be placed upon their own responsibility. They will manage their own works, make their own collections, and be practically independent of distant control from which the Government wishes to escape. It will be up to them to direct not only their farms but their irrigation systems, which they are fully competent to do if they will only attempt it.

## Uncompahgre Man Breaks Corn Record

**A**N announcement was made at the Olathe Corn and Potato Show that Morgan Sweitzer, one of the Uncompahgre project farmers, had broken all State records in producing 114 bushels of corn to the acre during the 1925 season. The corn was grown on 3.4 acres of ground on Garnet Mesa and the total yield amounted to 390 bushels of shelled corn which averaged 114 bushels to the acre. The corn was grown on ground that had been in orchard during previous years.

The measurements were made by the Montrose and Delta county agents and are official. Ten pounds of selected seed were sown to the acre. The seed bed was in perfect condition and a perfect stand was obtained.

It was hoed at once, cultivated, and irrigated as necessary. The corn was well matured and uniform in type and of a variety known as U. S. No. 133.

The corn was planted on May 7 and was not irrigated until May 16. The methods used as announced by Mr. Sweitzer consisted of less irrigation and more irrigation. The log of Mr. Sweitzer's activities was as follows:

April 16, 17, double disked.  
April 18, 22, plowed, followed by harrow twice.  
April 24, cross disked.  
April 25, cross harrowed.  
April 27, cross floated.  
April 28, rolled.  
April 28, 30, floated three times, diagonal each way and up and down.  
May 3, rolled.  
May 7, planted, 2-row planter, 10 pounds of seed per acre.

## Yakima Valley Crops Bring Good Returns

Crop movement in the Yakima Valley has been more satisfactory recently, and all crops probably will be marketed at remunerative prices before the new crop is available.

Shipments of apples have amounted to 10,773 cars, with 4,000 cars in storage.

About 700 cars of potatoes were shipped during February at prices running from \$45 to \$55 a ton for No. 1. Growers who held their crops in storage are having to sort, owing to some rotten ends, and will probably not get as much for their crop as if they had sold out of the field.

Hay is moving to market in a satisfactory manner.

May 8, marked out.  
May 16, irrigated.  
May 27, harrowed diagonally.  
June 1, irrigated.  
June 8, cultivated with 5-tooth harrow cultivator.  
June 12, cultivated.  
June 17, cultivated.  
June 22, marked out.  
June 25, irrigated.  
July 1, cultivated.  
July 7, cultivated.  
July 8, hoed weeds.  
July 10, marked out and laid by.  
July 18, irrigated.  
August 2, irrigated.  
August 21, irrigated.  
September 15, corn fully matured.  
September 22, slight frost.  
October 15, killing frost.  
November 19, December 11, harvested and stored in bin.

In referring to the success obtained by Mr. Sweitzer, Professor Olin, of the Denver and Rio Grande Western Railroad, stated that the secret of success lay in the cultivation of the soil and that big crops in all lines consisted of working the ground, working the ground again, and then working the ground some more.

The construction work now being conducted by the Bureau of Reclamation is stimulating to an inestimable degree business and industrial activities throughout the West.

The proposed Columbia Basin project in Washington will cost approximately \$193,360,000. The amount of land available for irrigation is estimated at between 1,000,000 and 1,500,000 acres.

## Agricultural Demonstration Program

**T**HE agricultural demonstration work on the Minidoka project, Idaho, is handled through two agencies—the United States Department of Agriculture and the county agent. John T. Montgomery, associate agriculturist of the Department of Agriculture, devotes most of his time to animal husbandry, and J. W. Barber, county agent, to crop work, poultry management, marketing, etc. In addition, Miss Esther V. Kahle, under university extension auspices, gives valuable aid and advice in dietetics, prenatal care, clothing problems, and other phases of home economics. All these agencies work in harmony with the Minidoka project office. The following is the program of demonstration work on the project for 1926:

Crop work will embrace the following schedule: Crop clubs (boys and girls); grain standardization and certification, with variety tests, disease control, and weed control; clover-seed production and marketing; corn improvement; potato improvement, involving seed production and selection and disease control; demonstrations on beans and peas; urging of permanent cropping plans, involving balanced rotations combined with appropriate livestocking systems providing outlets for bulky crops; general horticulture and home gardens; record keeping; marketing organizations.

An outline of the livestock program is as follows:

### CATTLE

#### BEEF

Selling surplus.

#### DAIRY

1. Elimination of inferior and scrub bulls by replacement with purebred, with known production.
2. Exchange of bulls to retain proven sires.
3. Purchase of few better bulls to head pure bred herds.
4. Cost accounts on dairy herds.
5. Cow-testing associations; organize more.
6. Dairy buildings:
  1. Sheds for cows,
  2. Milk houses (caring for milk and cream).
7. Feeding the dairy cow:
  1. Rations.
  2. Minerals.
8. Breeding problems.
9. Disease control:
  1. Sterility in heifers.
  2. Abortion.
  3. Tuberculosis test.
10. Expansion dairy outlets; cream pool; creamery.
11. Calf club.

### SHEEP

1. Flock improvement by—
  1. Use of better rams.
  2. Culling inferior ewes.
  3. Retaining choice ewe lambs.

4. Breeding ewes at proper age.
5. Breeding early to secure growth on lambs.
2. Study of flock production from standpoint of—
  1. Wool production.
  2. Mutton production.
3. Sale of pure bred ram lambs to range sheep men; sale of market lambs through cooperative shipments.
4. Disease and parasite control.
5. Sheep clubs.

### SWINE

1. Encourage keeping a few hogs on every farm.
2. Cooperate with few farmers in cost accounting.
3. Cooperate feeding tests.
4. Ton-litter contest.
5. Clubs.
6. Cooperative marketing.

### POULTRY

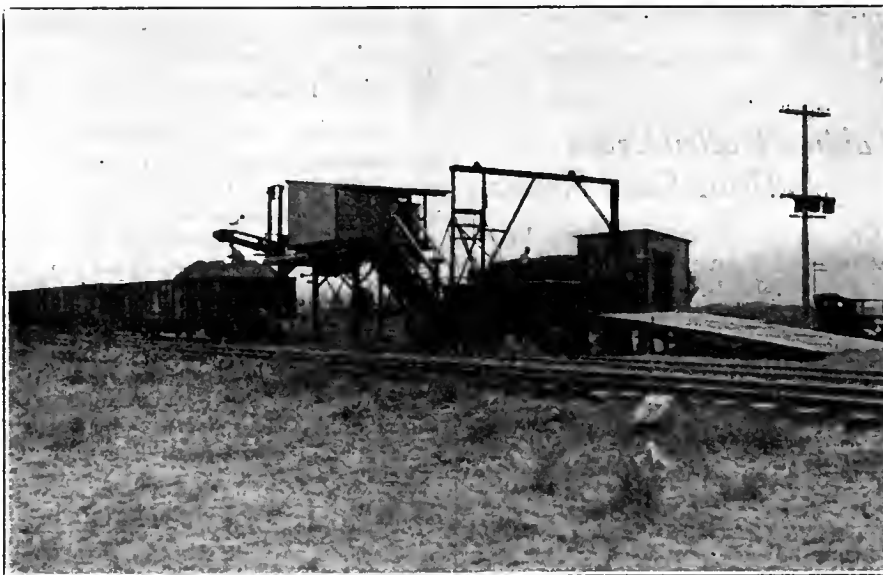
1. Improved housing.
2. Increase flock size on farms where poultry is a major industry.
3. Poultry accounting.
4. Improved breeding.
5. Marketing; cooperative egg marketing; cooperative turkey pool.
6. Capon raising.

Some attention will also be given to such matters as rodent control and the campaign against sparrows; predatory animal control; insect control; extermination of noxious weeds; home economics.

## Growing Head Lettuce After Raising Onions

Growing head lettuce in the Uncompahgre Valley after the Bermuda onion crop is harvested is advocated by K. Nakamura, according to a recent press dispatch.

Mr. Nakamura states that a Japanese farmer on California Mesa last year sowed some head lettuce about August 10 and it made fine heads, ready for market in October. It was an experiment and the lettuce was not cared for as it might have been. He states that one of the big marketing organizations would like to get 15 or 20 carloads of this lettuce in the fall, and believes that the farmers in the valley should grow more of it, as it could be harvested after the crop at high altitudes is marketed. It is his impression that the crop could be seeded after the Bermuda onion crop is harvested, thus raising two crops on the same ground in one year.



Electric sugar-beet dump on the Minidoka project, Idaho



## Citrus Fruit on the Projects

**N**EARLY three hundred thousand 75-pound boxes of grapefruit, oranges, and lemons were grown on three irrigation projects in Arizona and California in 1925.

A recent compilation shows that 1,823½ acres of land on the Salt River project Arizona; the Yuma project, Arizona-California; and the Orland project, California, in that year produced 22,299,475 pounds of citrus fruit valued at \$929,603, or \$540.50 an acre.

More than 92 per cent of the total yield was produced on the Salt River project, Arizona, where more than 20,000,000 pounds of grapefruit, oranges, and lemons were grown, valued at \$929,250, or \$630 per acre.

## TIETON WATER USERS REPLY TO QUESTIONS

The Tieton Water Users' Association, Yakima project, has sent out a questionnaire to each of the 1,225 water users on the division, asking, in substance, the following questions:

(a) Do you want more water for your land?

(b) Are you in favor of the 35-year plan of payments?

(c) In case the 35-year payment plan is made a law, do you favor taking over the operation and maintenance of the project?

Six hundred and one replies were received, 594 of which answered "yes" to the first question and 7 "no." All were in favor of the second, and 421 voted "yes" on the third question and 168 "no," a few not voting on these two questions.

## NEWLANDS FARMERS WANT ELECTRICITY

Water users on the Newlands project, Nevada, have been active recently in planning for and constructing power distribution lines to supply farms with electricity. Approximately 15 miles of such lines have been built or are under construction. The expense is borne by the water users themselves under cooperative arrangements. The Nevada Valleys Power Co., which distributes power generated at the Lahontan power plant, which is under lease to the Canyon Power Co., has submitted a proposal to the water users for the construction of lines and distribution of power over the project. Farmers in the Sheckler, Harmon, and Stillwater districts have formed tentative organizations to promote power development in their respective localities.

Should the Colorado River development be authorized by Congress, the general prosperity and wealth of the Southwest would be enhanced almost beyond calculation.

The statistics are shown in the accompanying table:

*Citrus fruit Grown on Reclamation Projects, 1925*

Project	Acre-age	Yields		Value	
		Total	Average per acre	Total	Per acre
		Pounds			
Salt River.....	1,475	20,650,000	14,000	\$929,250	\$630.00
Yuma.....	1½	1,350	900	63	45.00
Yuma Auxiliary (Mesa).....	73	967,875	13,258	29,075	398.29
Orland.....	274	680,250	2,483	27,210	99.30
<b>Totals and averages.....</b>	<b>1,823½</b>	<b>22,299,475</b>	<b>12,229</b>	<b>\$929,603</b>	<b>\$540.50</b>

## Aided and Directed Settlement

**S*****OLUTION** of the perplexing problems that have confronted the development of Federal reclamation in the country for the past decade is believed to be in sight, according to a statement issued recently by Secretary Work.*

*The proposed measure, which the Senate Committee on Reclamation has approved, to be used as an experiment in financing and aiding settlers on two projects, the Secretary believes, will determine definitely whether this method of developing lands under Government irrigation is feasible and practical. His statement follows:*

*"Reclamation Bureau officials are gratified at the progress being made in Congress toward the enactment of legislation which promises a satisfactory solution of reclamation problems, both from the viewpoint of Congress and the Department of the Interior. The bill recently drafted asking an appropriation of \$500,000 to cover a period of three years for experimentation on two reclamation projects to determine whether financial assistance to settlers would be both feasible and practical, has been approved by both the Senate Reclamation and Appropriation Committees. It is believed that Congress will before adjournment accept this measure, which embodies what the bureau feels are perhaps the first steps in a definite solution of one of the most perplexing problems which has confronted reclamation development in this country for the past decade.*

*"Legislation for State aid to reclamation settlers was first introduced in the Sixty-eighth Congress, and a law was enacted in 1924 obligating States to aid those selected settlers on new projects who possessed \$2,000 or its equivalent in farm equipment. With the passage of this act the Reclamation Bureau was, of course, obliged to observe this law and proceed under it. The State of Washington cooperated with the Reclamation Bureau in the administration of the new act, but Oregon and Nevada failed to extend their cooperation when the Department of the Interior sought to administer the new law in those States, especially those provisions relating to State aid for the new settlers.*

*"The legal division of the Interior Department recently, after an extensive survey and study of State statutes relating to public lands, found that several of the States could not, under their constitution, extend aid to settlers as provided for in the national act. This situation was explained to the Senate Committee on Reclamation last week, and I immediately offered the same substitute for State aid which the department offered and supported last year in the Kendrick bill. This substitute proposal was accepted by the Senate committee, and a bill at once drafted, which was introduced in the Senate and favorably reported out of committees.*

*"Reclamation Bureau officials believe that aid in preparing land for new settlers will be necessary. Many foreign governments have extended similar aid to pioneer land settlers, which has resulted in some instances in profitably tilled land, and I am sanguine that the proposed new plan will at least furnish a basis in this country for constructive experimentation. It is felt, however, that the public mind perhaps is not at this time sufficiently advised in this direction to either approve or disapprove such a policy, from an immediate permanent viewpoint, and the Reclamation Bureau is not willing now to recommend heavy expenditures in such a line of development until experimentation has proved the wisdom of such a course."*

## Organization Activities and Project Visitors

**D**R. Elwood Mead, Commissioner of Reclamation, was in New York City during March as the representative of the Department of the Interior on Engineering Council for the consideration of the question of a Department of Public Works.

Thomas Dignan, an attorney in Glasgow, Mont., has been in Washington, D. C., recently representing the two divisions of the Milk River project in the matter of adjustments.

George E. Stratton, superintendent of the Milk River project, spent some time at the Washington office in consultation with the commissioner on project matters.

O. H. P. Shelley, newspaper editor of Red Lodge, Mont., visited the Washington office during March to discuss questions relating to adjustments on the Milk River project.

Col. B. F. Fly, guardian of the Yuma Mesa, has been appointed special Washington representative of the Truckee-Carson irrigation district, Newlands project.

Gov. D. W. Davis has submitted his resignation as director of finance.

Randolph E. Fishburn, American consulting engineer, and Armando Santacruz, Mexican consulting engineer, members of the International Boundary Commission, were in Yuma during February, in connection with a survey of the Colorado River to determine definitely the status of about 1,800 acres of accretion land at present undeveloped and for which water is available.

Superintendent Weber of the Orland project has been in Berkeley recently for a conference with the district counsel and the counsel for the Orland Unit Water Users' Association regarding certain stipulations connected with the adjudication suit.

Assistant Engineer E. T. Eriksen of the Orland project spent considerable time at Colusa, Willows, and Red Bluff in an examination of the county records for use in the adjudication suit.

Assistant Engineer E. R. Romberg, of the Grand Valley project, was in Denver for several days' vacation.

W. H. Olin, agriculturist of the Denver & Rio Grande Western Railroad; Waldo Kidder, agriculturist, Colorado Extension Service; and B. W. Fairbanks, livestock extension agent of the Colorado Extension Service, visited the Uncompahgre project recently.

District Counsel B. E. Stoutemyer was on the Minidoka project for a couple of days to attend public meetings held by the water users of the Burley irrigation district for the purpose of explaining the terms of the proposed agreement under the act of December 5, 1924.

### *Yakima Apples Shipped Abroad*

*Two cars of fancy Winesaps left the Yakima project recently bound for England and Germany. The German market requires the larger sizes and the shipment to that country carried sizes ranging from 125 to 175 apples per box. The English market takes a smaller apple, and the fruit going there ran from 175 to 216 per box.*

*The apples are being shipped across country and will be loaded for export in New York.*

Superintendent Youngblutt, of the Belle Fourche project, was in Washington recently in conference on repayments and terms under which water would be delivered to settlers in 1926.

Engineer Walker R. Young has been placed in charge of the Kittitas project with headquarters at Ellensburg, Wash.

John A. Lee, power-house foreman on the Riverton project, has resigned to accept a position with the Sunnyside Mining & Milling Co., of Eureka, Colo.

Associate Engineer J. R. Iakisch, of the Shoshone project, made an inspection trip recently to the Lower Yellowstone project in connection with the preparation of a report on proposed drainage construction on the latter project.

Prof. Ivan C. Crawford, dean of the School of Engineering of the University of Idaho, was a recent visitor at the American Falls Dam.

Recent visitors on the Milk River project included Frank Scotten and J. C. Dow, of the Montana Power Co.; District Counsel Roddis; W. Y. Cannon, Montana manager for the Utah-Idaho Sugar Co.; Robert Howard, superintendent of the Chinook Sugar Factory; and E. R. Schepplemann, chief clerk of the Lower Yellowstone project.

Assistant Engineer E. W. Fritsch, of the Newlands project, was called to Evansville, Ind., recently on account of the serious illness of his father, who died two hours after his arrival.

A conference was held in Reno during February for the consideration of the application of the Lake Tahoe Co. to lease the Government 63-acre tract at the outlet of Lake Tahoe. Those present at the conference included Superintendent Richardson, of the Newlands project, representing the Government; C. T. Bliss and Henry F. Droste, representing the Lake Tahoe Co.; E. J. Foulds, representing the Southern Pacific Co.; and Roy Stoddard, C. E. Kent, B. S. Holmes, and A. D. Drumm, representing the Truckee-Carson irrigation district.

Victor L. Minter, former chief clerk on the Carlsbad project, has resigned to accept the position of secretary of the Carlsbad Chamber of Commerce. He has been succeeded as chief clerk by Walter C. Berger, former bookkeeper on the Yuma project. Jean C. Thrailkill, formerly on the Riverton project, will succeed Mr. Berger as bookkeeper at Yuma.

A. C. Cooley, of the Department of Agriculture, attended the recent economic conference at Hermiston, Umatilla project. It is believed that much benefit will accrue to farming operations on the project as a result of the conference, which was attended largely by project water users.

C. R. Wheeler, assistant clerk, has been transferred from the Williston project, North Dakota, to the Klamath project, Oregon-California.

# NEW RECLAMATION ERA

VOL. 17

MAY, 1926

NO. 5



"THE OPEN DOOR"

DEPARTMENT OF THE INTERIOR—OFFICE OF SECRETARY WORK

## *Hand-picked Settlers*

*“SECRETARY of the Interior Work, in a recent public utterance, recognizes the basic ailment of Government reclamation. He said that the wrong kind of settlers had been permitted to take up land on new projects. A survey of one project showed an ex-deep sea diver, an ex-baseball player, and a half dozen other ex-this or ex-that—men who obviously were not fitted to take up new land and make it produce as might be expected.*

*“Hereafter the Government is going to hand-pick every settler for reclamation projects. In the early days of western colonization everyone was invited to come and take a homestead. The West wanted people, and it didn’t make much difference then whether they could make a success at farming or not.*

*“Reckless settlement of irrigation projects is just as damaging as reckless colonization. The West still needs more people; but one good citizen—a dependable pioneer who can be expected to build up the taxable wealth of the commonwealth—is of more value than a dozen herded in just to increase the census count. In its strictest significance, ‘hand-picking’ settlers may sound cruel, but it will eliminate in the long run a great deal of the suffering and sorrow that come when the law of the survival of the fittest begins to operate.”*

*—From an editorial in the Salt Lake Tribune.*

# NEW RECLAMATION ERA

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Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

MAY, 1926

No. 5

## *High Lights on the Reclamation Projects*

**O**PERATION of the Boise project, Idaho, was turned over to the board of control of the Nampa-Meridian, Boise-Kuna, and Wilder irrigation districts on April 1. Superintendent Bond was retained by the board as manager of the project.

**D**URING March 289 carloads of agricultural products, valued at \$261,700, were shipped from the Yuma project. Since the first of the year the value of such products has amounted to \$1,094,200. Collections of charges during the month amounted to \$59,840.01.

**N**INETY acres of citrus trees were planted recently on the Yuma Mesa, mostly in 10-acre tracts, and it is estimated that this year's plantings will amount to 165 acres, most of the development being done by nonresident unit holders. The outside public is becoming more and more interested in the possibilities of the Yuma Mesa, and the development in the next few years will probably be much greater.

**S**UPERINTENDENT Page of the Grand Valley project reports that there seems to be very little disposition on the part of any of the farmers to further delay payments of charges if it is at all possible to meet their obligations.

**M**ANY thousand baby chicks have been received on the Newlands project and many more have been hatched on the project during the month. The coming year will mark the greatest poultry activity, including chickens and turkeys, that the project has experienced.

**P**RELIMINARY forms have been mailed to all owners of unoccupied land on the Belle Fourche project as the first step in the land-listing program under the supplemental contract.

**T**HE canal and distribution system of the south side pumping division of the Minidoka project was taken over for care, operation, and maintenance by the Burley Irrigation District on April 1.

**A**N economic survey of Idaho agriculture is being carried on by representatives of the University of Idaho, the Idaho State Department of Agriculture, and the United States Department of Agriculture. A study will be made of the production and marketing of Idaho farm products, consumption and distribution of farm products in home and outside markets, competing producing areas, and a determination of the most profitable combinations of farm enterprises. The crop and livestock census reports for the Minidoka project for several years were loaned for this research.

**A**BOUT 350 carloads of potatoes were shipped from the Minidoka project during the month, bringing to growers approximately \$1,000 per car. At the end of the month dealers were paying around \$4 per hundred weight for No. 1 Russets.

**I**T is estimated that 250,000 sheep and 40,000 head of cattle were fed in the North Platte Valley this season, furnishing a market for project feed and adding greatly to the fertility of the soil. The implement companies in the valley report the sale of 325 manure spreaders since January 1.

**T**HE Holly Sugar Corporation reports the signing of contracts for 7,000 acres of sugar beets tributary to the Grand Junction factory, of which probably one-third is on the Grand Valley project. The acreages of early potatoes and beans will continue to place these crops among the primary crops of the project.

**D**ELINQUENT water users on the Uncompahgre project were notified on March 1 as to the amounts required of them prior to delivery of water during 1926. One thousand and twenty-eight delinquent accounts were mailed, and during the month 480 of these were cleared for water by the payment of charges. Total collections amounted to \$59,504.71 during the month.

**T**HE first car of Bermuda onion sets ever received on the Uncompahgre project arrived on April 1. This car contained 4,000,000 sets. It is estimated that the crop should mature about August 15 and that an excellent market will be available.

**T**WO rat men have been employed on the main canal, Sunnyside division, Yakima project, and as a result 800 gophers were trapped in addition to digging out and puddling numerous gopher holes in fills that were sufficiently close to the water to be dangerous.

**O**N the Tieton division of the Yakima project payments are being made much better than they were last year, the total collections for March amounting to \$29,220. Out of 1,300 water users 150 were delinquent to the extent that they could not get water without making additional payments. This represented about 4,600 acres. The greater part of these will pay in a short time in order to get water, as they represent land the majority of which is able to pay. The present policy of insisting on the payment of charges is meeting with good results on the Yakima project.

**E**XCAVATION of the upper and lower tunnel approach channels at Guernsey Dam, North Platte project, was completed on March 19, and the river started through the diversion tunnel on that date.



## Optimistic Outlook on West's Problems Taken by Secretary Work

*Discusses legislation regulating grazing on public domain, adjustment of reclamation problems, development of Colorado River Basin, oil conservation on Osage Indian Reservation, mineral leasing on Indian reservations, and construction of Coolidge Dam.*

**A**N optimistic outlook for a definite settlement of the major problems of the West during the present session of Congress was taken by Secretary Work of the Interior Department in a statement issued prior to his departure on a trip to the Southwest to inspect proposed dam sites for the lower Colorado River development and other official business connected with his department.

The Secretary asserted that through cooperation between the committees of Congress and the department, satisfactory legislation has been proposed for the regulation of grazing on the public domain, the final adjustment of Federal reclamation difficulties, the development of the lower Colorado River, the conserving of oil on the Osage Indian Reservation instead of compulsory leasing, and other important national policies of concern to the West.

### ESTABLISHMENT OF GRAZING DISTRICTS

"Lack of a grazing policy on the national domain," said Secretary Work, "has been a disturbing factor in the livestock business of the West for a number of years. The gratuitous use of the public domain as an unrestricted range for livestock has led to over grazing and destruction of the native grasses. The Interior Department has recommended the rectification of these conditions at the last two sessions of Congress. It was not until the present Congress, however, that definite steps were taken toward legislation.

"The bill now before Congress provides for the establishment of grazing districts on areas of the public domain through the petition of a majority of the livestock raisers using them for grazing purposes. It also authorizes the execution of leases between the Government and these organized livestock growers for a period of 10 years in which they are to be given exclusive grazing privileges on them. The amount of fees are to be determined on a basis of the size of the area leased, the number and kind of livestock, and the value of grazing rights.

"The advantages of this proposed new policy are self-evident. Stockmen will have permanent areas on the public domain for the ranging of their cattle. It will be to their interest to preserve and conserve the pasturage. A special feature of the proposed law prohibits the homesteading of the leased grazing districts under the stock-raising and general enlarged homestead acts. This means that these areas can not be constantly invaded by outsiders, as is the case under the present system.

### RECLAMATION ADJUSTMENTS

"With regard to Federal reclamation, a final appraisal of this Government enterprise is included in legislation now before Congress for final action. The terms of the omnibus adjustment bill provide for the charging off of construction costs for works built by the Government in the past to irrigate worthless, infertile, and unproductive lands on the various proj-

ects. They also provide for the negotiation of contracts between the United States and water users' associations and irrigation districts in which these organizations are to take over the operation of the projects and guarantee the repayment of construction costs due the Government.

"Heretofore the execution of these contracts has been difficult and, in many instances, impossible. Farmers on the projects through their constituted organizations have been unwilling to assume joint liability for the repayment of these construction costs charged against their projects covering worthless and unproductive farms. The assumption of these costs by the Government to be charged off as a fixed loss will straighten out this situation. It will place Federal reclamation, I believe, on a sound business basis and make it a going concern in the future.

### THE COLORADO RIVER BASIN

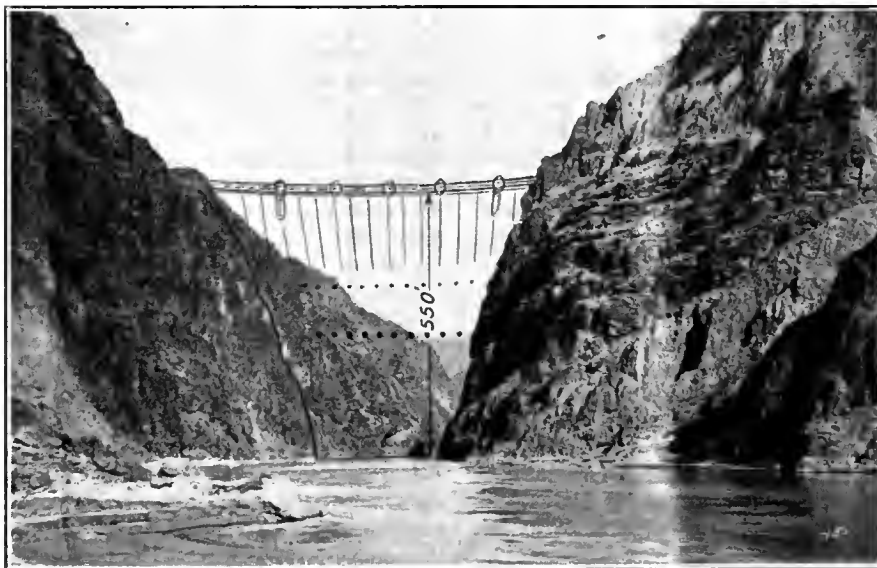
"Concerning the development of the lower Colorado River, this question has been under consideration for the last 80 years. Almost \$1,000,000 have been expended by the Federal Government in investigations of flood control on the river, its irrigation, power and domestic water resources. For the first time since these inquiries were inaugurated prior to the outbreak of the Civil War, a concrete and comprehensive plan has been recommended to Congress by the Interior Department for developing the natural resources and possibilities of the lower Colorado.

### OIL CONSERVATION

"An important step toward oil conservation has also been taken in legislation recommended to Congress with regard to leasing of Osage Indian lands. This reservation contains the largest oil pool ever discovered in the world. Under the present law it is compulsory for the department to offer for lease large areas of these mineral lands annually regardless of market oversupply, prices, and disastrous competitive drilling. The new legislation, which has been urged for several years by the department, proposes to remedy this situation by providing for the optional leasing of this rich oil field in the future.

"Other legislation dealing with the West has been recommended by the department to Congress and is now in the course of enactment. Mineral leasing on the Executive order Indian reserva-

(Continued on page 76)



The Boulder Canyon damsite on the Colorado River

## Selecting Settlers on Basis of Approved Qualifications

*This is the first step, in the opinion of Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, in laying the foundation for the success of new projects. The second should be aided and directed settlement*

**T**HE opening to entry early in April, of 20 irrigable farm units on the Riverton project, Wyoming, marks the beginning of an entirely new method of selecting settlers on Federal reclamation projects under the new law.

On each irrigation project where public land is still available for entry examining boards have been appointed by the Secretary of the Interior, usually comprising three individuals, including the superintendent of the project and two public spirited citizens, who serve without pay. Before being allowed to enter a vacant public land farm unit on a Federal irrigation project each prospective settler must satisfy this examining board that he possesses the necessary qualification of industry, experience, character, and capital to warrant the belief that he will be successful in his venture.

### THE FARM APPLICATION BLANK

As an aid in guiding the decision of the examining board, a form of farm application blank has been prepared by the Bureau of Reclamation which each prospective entryman is required to fill out and file with the board, in proof of his fitness and qualifications to undertake the development of a farm unit. The first three questions relate to the entryman's qualifications to make entry under the homestead laws; his citizenship; and whether he has a preference right as an ex-service man. Then follow questions

covering his present occupation, age, farming experience under irrigation or in the humid regions, sex, marital condition, age and sex of children, number of dependents, health, ownership of other farm land, and whether this is mortgaged. The names of three citizens who have known the applicant for at least five years must be submitted as references. Then follows a detailed statement of assets in the form of cash, livestock, farm implements, and furniture. The estimated value of these assets, less the liabilities in the form of mortgages and other debts, gives the net worth of the applicant, which under the regulations, must be at least \$2,000.

### RATING THE APPLICANTS

In order to determine the relative standing of the applicants, each of the basic qualifications of industry, experience, character, and capital is considered as having a possible weight of 25 per cent, in accordance with the accompanying table:

No applicant will be considered eligible who falls below the minimum named in any one of the headings in this scale; or who does not, in the opinion of the examining board, possess the health and vigor necessary for active farm work.

### NEW PLAN MEETS APPROVAL

The form of the farm application blank is the result of our experience in the selection of settlers and planned rural community development in Australia and in California State land settlement, but in order to check this new departure with the opinions of others who are thinking along these lines, the form was sent to each of the State agricultural colleges for comment. It is gratifying to note that in every instance these replies indicate that the bureau has taken a forward step in thus attempting to safeguard the interests of both the Government and the settler, as indicated by the following extracts:

"I think your questions are very practical and answers to these questions should lead you to be able to make an intelligent

(Continued on page 76)

Industry	Per cent	Farm experience	Per cent	Character	Per cent	Capital	Per cent
Fair.....	5	Two years or more in farming, other than by irrigation.....	15	Fair.....	5	\$2,000	15
Good.....	15	Two years or more in irrigation.....	25	Good.....	15	3,000	20
Excellent.....	25	do.....	25	Excellent.....	25	5,000	25

## Optimistic Outlook

### By Secretary Work

(Continued from page 74)

tions is to be definitely settled by the legislative branch of the Government, in whom sole authority for deciding this issue is vested. With the enactment of a law authorizing the appointment of a consulting board of engineers, construction work on the Coolidge Dam in Arizona is soon to be started. This reclamation project will bring 100,000 acres of Indian and private lands under irrigation.

"Most of the activities of the Interior Department deal with economic problems of the West. I regard the work of the Department and its services during the past year in the interest of the people of this section of the country as the most satisfactory since I became Secretary of the Interior three years ago."



An abandoned homestead—one of the results of not selecting settlers on the basis of approved qualifications

## Giving the New Settler a Chance

THE following letter is self-explanatory. It is published with the consent of Mr. Durrill as an example of what one private citizen is willing to do to make his purchasers successful, and as a practical demonstration of aided and directed settlement:

PAVILLION, WYO., January 30, 1926.  
MR. GEORGE C. KREUTZER,  
Denver, Colo.

MY DEAR MR. KREUTZER: I have been reading articles and speeches made recently by such men as Senator Kendrick, Representative Winter, and yourself regarding reclamation and its ailments, and I must congratulate you and the others on their sensible policy. I believe and always have that the real success of reclamation projects is the selection of and financing the entrymen.

As I told you when in Denver some months past my intention was to get one or two good farmers whom I could depend on and to finance them and place them on some of my land. This has been a pretty hard job. I could find plenty who were willing to be financed but doubtful as to success. I have finally found a man named Kirby, whom I have known for years, and who is a good farmer and sheepman. He has a wife, three sons all large enough to do farm work, two daughters, good workers, and about \$1,000 in cash.

I sold him the northwest quarter of section 13, and the east half of the northeast quarter of section 14, 3 north and 1 east, near Pavillion, 240 acres for \$20 per acre on

10 years' time, at 6 per cent interest, no interest the first year. I am to loan him the money to build a house, buy fencing to fence the land, including woven wire for 80 acres for sheep pasture. He is to plant 40 acres of this to yellow sweet clover, and 20 acres to alfalfa this year. Will plant oats as a nurse crop. He is to haul material, and build house and fence

### Reclamation Progress in Agro Romano Region

*The Minister of National Economy of Italy has prepared recently an interesting report on the progress made in reclaiming the Agro Romano. Water courses have been regulated and the malarial peril has been greatly reduced.*

*Perhaps the most effective Government provision for the encouragement of colonization is the granting to approved colonists of Government loans at 2½ per cent interest instead of the regular 4 per cent, payable in 45 years, the first repayment not being made until 5 years after the granting of the loan. During the past three or four years especially, the Government has granted large sums under these conditions.*

at his own expense. I am also to furnish him three good milk cows, and all the money advanced by me is to be repaid in three years.

I am also to let him have on shares 350 good breeding ewes, 200 in October, 1926, and 100 in 1927; also 7 bucks. These are to be good aged ewes, and registered bucks, which will cost me about \$6 per head for ewes, and \$35 for bucks. I am to get one-third of the wool sacked at shearing pens, I to furnish sacks, also one-third of the lambs at the farm in October. He is to make loss of sheep good, and to return to me at the expiration of five years the same number of sheep and of no less value.

He is to pay 6 per cent interest on the land after the first year for 5 years, or to the sixth year, from the sixth to tenth year to pay interest and \$250 each year on principal.

He will have 3 cows, 100 hens, 10 turkeys, 2 brood sows; and I do not see any reason why this man can not succeed, and I know he will. His sheep should shear 10 pounds of wool each at 30 cents per pound or \$3 each, and kept on a farm should produce 100 per cent lambs, and at 70 pounds each lamb, at 10 cents per pound would bring \$7 per head. The total income from sheep would be \$3,500, his two-thirds would be \$2,376, and as he sells his wool in the spring and lambs in the fall, he has two pay days each year.

With his chickens, turkeys, cows, and hogs they will nearly make their living, or a very large part of it.

They will commence building the house this week, and hauling out fence material. I have another piece of land near Pavillion I may make a similar deal on.

If the Government would make similar deals, with selected entrymen, and have a good farm boss, all money advanced by the Government invested by a committee along the lines of my deal, there would be, in my opinion, a different story to tell about the reclamation projects and repayment to the Government of money advanced.

Trusting you are getting along nicely with the settlement of this project, and that we will get an appropriation sufficient to go on with the work, I am, with personal regards,

Yours very truly,

M. S. DURRILL.

NOTE.—Two months later Mr. Durrill wrote to Mr. Kreutzer as follows:

I was away two months. On my return I brought back from Wisconsin 22 purebred and high grade Guernsey cows and heifers and one bull, a royally royal fellow. All cows and heifers will freshen this spring. I brought four of these to Mr. Kirby, to whom I sold the 240-acre tract that I wrote you about.

## Selecting Settlers on Basis of Qualifications

(Continued from page 75)

selection of persons who desire to go on irrigated land in Government reclamation projects.

"I have had a great deal of personal experience with men who have come poorly prepared to farm under irrigation, and I am in a position to know that your plan of requiring certain qualifications of applicants is in the right direction.

"By this method you should be able to select men capable of handling farms and avoid those who are incapacitated for farm success, but who are looking for something to be given them by the Government.

"The provisions are reasonable and I can not see that any person can object to them. To those in charge of the project, and for any other agency that is working to aid the settler in developing his farm, these questionnaires will give a good background as to the farmer's ability and experience; a factor of considerable importance.

"I only wish that this precaution of getting the right kind of settlers on our projects had been taken earlier. I am sure, however, that this is a fine requirement, and will serve to make our reclamation projects much more successful."

### FINANCIAL AID NEXT STEP

The selection of settlers on the basis of approved qualifications is the first step in laying the foundation for the success of new projects. The second should be the provision for furnishing these men with additional financial aid in the early years of development, and with the advice of trained agricultural advisers concerning their farming operations. Legislation looking to this end is pending in Congress, and its enactment will mean another material step forward in our work of placing reclamation on a business and paying basis.

THE Uncompahgre project reports that announcement has been made by the county clerk's office that, on account of the good year experienced in the valley as a result of the prices received for the 1925 crops, a number of farm mortgages have been paid off and there has been a decrease in the usual number of spring chattel mortgages to finance farmers in putting in crops.

## New Contracts Between the United States and Reclamation Projects

THE act of December 5, 1924, amended the reclamation law and provided a new repayment plan for returning to the United States the construction costs of Federal reclamation projects. This act fixes the annual construction repayments at 5 per cent of the average annual crop returns over a period of 10 years or the years of record. Where the growing season is long and crops of high value are produced, the annual construction payments to be made by a water user will be greater than on some other project where the growing season is short and the crops grown have relatively low value.

Before the passage of this act, construction costs were repaid over a period of 20 years. The annual installments were fixed at 2 per cent of the acre cost of construction for the first 4 years, 4 per cent for the next 2 years, and 6 per cent for the remaining 14 years, regardless of the acre cost of construction or the value of the crops produced.

The act of December 5, 1924, also provides that water users who desire the more liberal repayment terms must take over the project through a legally organized irrigation district or water users' association and operate the irrigation system themselves.

The accompanying table shows the progress being made in making and completing contracts between the Depart-

### The Water Supply On the Projects

*Precipitation during the winter of 1925-26 has been considerably below normal throughout practically the entire West, and as a result the watersheds above most projects of the Bureau of Reclamation are deficient in snow cover. Reports as of April 1 indicate that very low summer natural flow is probable, but storage on hand or fairly certain to accumulate during the spring assures a reasonable water supply for practically all projects. The Okanogan, however, and the Truckee lands of the Newlands project may experience a severe shortage.*

*General storms occurring early in April in California and the northern Rocky Mountain region have greatly improved the situation and in many localities conditions have probably been restored to normal.*

ment of the Interior and the various reclamation projects. The water users on projects who desire the benefits of the act of December 5, 1924, must make a request of the Department of the Interior for a new repayment contract followed by perfecting a legally organized irrigation district or a water users' association. The contract must first be approved as to form by the Secretary of the Interior, after which it is voted on by the water users, and then confirmed by court before it becomes effective.

In addition to making these new contracts for existing projects which are now constructed, the department must have repayment contracts in force before new projects authorized by Congress can be constructed. The table also shows the status of contracts with new projects.

### Colorado Potato Growers' Exchange

Announcement was made recently by the Colorado Potato Growers' Exchange that \$56,000 held in the reserves as an accumulation from operations during the calendar year 1923 would be distributed to the growers. This sum represents the cooperative savings and the surplus from the first year's operations, and does not include the reserve accumulation of the 1924 or 1925 seasons. These reserves will be distributed later.

Status of new contracts between the United States and reclamation projects, April 15, 1926

Project	Division	Form of contract approved by Secretary of Interior	Election held by water users	Confirmatory proceedings by court. Date of decree	Date of contract	Purpose of contract
<b>EXISTING PROJECTS</b>						
Boise <sup>1</sup>	Nampa and Meridian Irrigation District.	Sept. 9, 1925	Nov. 10, 1925	Feb. 10, 1926	Mar. 2, 1926	Turning project over to water users, and making construction repayments on crop-return basis as authorized by act Dec. 5, 1924.
Do. <sup>1</sup>	Boise-Kuna Irrigation District.	Jan. 14, 1926	Mar. 13, 1926			Do.
Do. <sup>1</sup>	Wilder Irrigation District.	Feb. 10, 1926	Mar. 20, 1926			Do.
Do. <sup>1</sup>	Big Bend Irrigation District.	Jan. 19, 1926	Mar. 9, 1926			Do.
Minidoka <sup>1</sup>	Burley Irrigation District.	Feb. 1, 1926	Feb. 26, 1926		Mar. 15, 1926	Do.
King Hill <sup>1</sup>	King Hill Irrigation District.	Oct. 9, 1925	Dec. 8, 1925		( <sup>2</sup> )	Do.
Umatilla	West Extension Irrigation District.	Feb. 25, 1926	Apr. 10, 1926			Do.
Do.	Hermiston Irrigation District.	Mar. 22, 1926				Do.
North Platte	Interstate Division.	Feb. 15, 1926				Do.
Sun River	Greenfields Irrigation District.	Feb. 16, 1926				Do.
Yakima	Sunnyside Irrigation District.	Mar. 25, 1926				Construction Gibson Reservoir and providing for its repayment.
Shoshone	Shoshone Irrigation District, Garland division.	Apr. 1, 1926				New plan of repayment of construction costs.
						Turning project over to water users, and making construction repayments on crop return basis as authorized by act Dec. 5, 1924.
Strawberry	Strawberry Water Users' Association, entire project.	Sept. 17, 1925				Do.
<b>NEW PROJECTS</b>						
Yakima	Kittitas Reclamation District.	Dec. 30, 1924	Feb. 11, 1925	Mar. 10, 1925	Dec. 19, 1925	Construction Kittitas division, Yakima project, and providing for its repayment.
Vale	Warm Springs Irrigation District.	Sept. 14, 1925		Dec. 18, 1925		Purchase by United States of interest in Warm Springs Reservoir.
Baker	Lower Powder River Irrigation District.	Jan. 29, 1925				Beginning construction Baker project and providing for its repayment.
Salt Lake Basin	Echo Reservoir and Weber-Provo Canal.	Sept. 15, 1925				Construction Echo Reservoir and Weber-Provo diversion canal and providing for repayment.

<sup>1</sup> Water users took over project works on Mar. 25, 1926

<sup>2</sup> Water users took over project works on Jan. 1, 1926.

<sup>3</sup> Not yet signed by Secretary pending confirmation.

## Women on the Projects and Their Relation to Better Agriculture

*The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life*

*By Moe A. Schnurr, Secretary to the Commissioner and Associate Editor New Reclamation Era*



A home on the Boise project, Idaho

### Personality in the Home

**I**T is the home that is stamped as "being different" from the rest that has as its manager a woman whose ingenuity has prompted her to weave her personality into the making of her home, and the moment you enter the house you are in its environment. Its expression is in evidence everywhere, and can not be dimmed by the lack of funds or other handicaps.

The first thing that impresses one is its originality—it may be recognized in arrangement, color schemes, etc.

In addition to the effect on the visitor it is a great satisfaction to the one working out her ideas. The feeling must be akin to that experienced by the Navajo Indian woman weaving her story into a blanket, basket, or rug.

### CHOOSING COLORS

One of the outstanding attractions of a home is the application of an intelligent and unusual use of color, whether it be for furnishing up an old house or adding the finishing touch to a new one.

The first thing to consider in selecting colors for a room is the exposure. Warm tones should be applied to a northern or

eastern exposure, while a southern or western exposure would call for colors to offset the effect of sunshine. After you have selected your predominating color, your imagination will suggest contrasting and related colors.

### DRAPERIES AND HANGINGS

There is no better place for a display of good taste than in your selection of these. Their texture must be such as to hang in graceful lines and their color beautifully contrasting and harmonious.

### CURTAINS

The life of general draperies is somewhat longer than that of curtains for the windows, which generally have to be renewed every few years.

In planning curtains keep in mind that windows are put in houses in order to admit light and air. Make your curtains as simple as effectiveness will permit. Elaborate curtains defeat the purpose of windows and are out of place in the average home.

Look carefully at the shape and size of the windows and how they are placed in the walls. Picture the effect of curtains of various styles on those particular win-

dows and how they will appear from the outside as well as the inside of the house. If there are lovely views from the windows, study how to keep these without sacrificing privacy and an attractive interior. An unattractive view may need to be screened by curtains, but beware of shutting out too much light.

Study the general style of your room. Curtains can help to make a room homelike and inviting or dignified and formal, depending on the kind of material used and how it is hung.

Side draperies give a finished appearance to the window and are a good means of adding color to the room. In small homes, side draperies that end on a line with the apron of the window are more suitable. If a more formal effect is desired, let them extend to the baseboard or an inch above the floor.

Before buying curtain material get samples of the kinds that seem most suitable and see how they go with walls, woodwork, floor, and furniture by both day and artificial light. Strong light shining through curtain fabrics often brings out striking effects not suspected until put to this test. Excellent curtain materials can sometimes be found among the dress goods.

Fabrics and colors that will clean well and withstand light are the best bargain in the end. Examine also for defects in the weave that may show up when the curtains are hung.

With figured wall paper, choose plain-colored curtain material. If the walls and most of the furnishings are plain, the curtains may be figured, but preferably with the background the same color or slightly deeper than the walls. With cream walls, for instance, a cretonne with soft tan background and figures that repeat the colors used elsewhere in the room might be suitable for living and dining rooms.

In selecting figured materials give preference to conventional designs that will stand the test of being looked at day after day.

Sprawling designs make the window look shorter and broader, and stripes tend to increase the height and if used in excess give a stiff uncomfortable effect.

Measure the windows with care before buying the material. Accuracy in cutting and neat sewing go a long way toward insuring well-hanging curtains.



# Project Women and Their Influence in the Home and on Farm Life

*Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community*

## Readers' Comments and Suggestions

My article in the last issue giving the farm-bred girl her innings and stating the shortcomings of the city-bred girl in the matter of making a contented and happy home on the farm brought a number to the defense of the girls in the cities.

One letter, from a man, reads:

"I feel that I should take some exception to the first article which contains something of a slam on the town-bred woman. Each day as I view the vast army of town-bred women going to and from their employment, the thought arises in me how much better it would be if many of them were married to honest farmers working good reclamation farms. There must be very many of them who would be willing to change from a two-room apartment to the wide horizons of the West, and they ought all to have a chance. Most of them would make good and industrious wives and mothers, and the opportunity to fulfill their destinies should not be closed against them on the reclamation projects. They would soon adjust themselves to the new conditions. I am speaking for the honest, thoughtful sensible girls who exist in large numbers in all of our cities."

Another letter, from a woman, reads:

"If the RECLAMATION ERA wishes to serve the project families, one of the best means for doing so, it seems to me, would be to publish articles or letters telling how to insure health and guard against disease. Many of the homes are remote from towns, and often there must be many hours' delay in securing the aid of a physician. In many cases, too, economic conditions are such that calling a doctor is not to be considered unless the need is very urgent.

"In many of these homes the RECLAMATION ERA is the only periodical that comes, because of the lack of money for subscriptions to others.

"I would suggest articles on diet, practical and nontechnical (avoiding such terms as calories, carbohydrates, nitrates); articles on how to dress children in the various seasons; how to prevent colds in children; on the ventilation of houses; on the symptoms of 'flu,' pleurisy, measles, etc., and the proper care of patients. The number of subjects that could profitably be treated is legion."

"I should also particularly like to see a department for boys and girls in the ERA. Much could be done to make them inter-

ested in the life around them and to make them love it. They could be led to feel a sense of responsibility in helping to build up the new home, to help to make the most of their materials, to keep the home and premises clean and orderly."

"A great work could be done, too, in teaching the right care and treatment of animals. Humane societies have not extended their influence to some of these localities, and in many instances neglect of the proper attention to the care of animals is most deplorable."

These suggestions are all good, and in future issues I will endeavor to broaden out into these subjects.

## Try This

### POTATO CAKE

1 cup butter.	1 teaspoon nutmeg.
$\frac{1}{2}$ cup grated chocolate or cocoa.	$\frac{1}{2}$ teaspoon cloves.
2 cups sugar.	$\frac{1}{2}$ teaspoon allspice.
$\frac{1}{2}$ cup milk.	$\frac{1}{2}$ teaspoons cinnamon.
$\frac{1}{2}$ cup English walnut chopped.	1 teaspoon lemon and vanilla mixed.
2 cups flour.	cup mashed Irish potatoes seasoned for the table.
4 eggs.	
3 teaspoons (even) baking powder.	

All measurements even.

### METHOD

Cream butter and sugar, add chocolate, eggs beaten together, flour sifted with baking powder and spices. Add nuts and potatoes and extracts. Bake in slow oven.

## National Reading Circle A Real Opportunity

The Bureau of Education sends on request, and without any charge, reading courses as follows:

### Course

1. Great Literary Bibles.
2. Masterpieces of the World's Literature.
3. Reading Course for Parents.
4. Miscellaneous Reading for Boys.
5. Miscellaneous Reading for Girls.
6. Thirty Books of Great Fiction.
7. Thirty World Heroes.
8. American Literature.
9. Thirty American Heroes.
10. American History.
11. France and Her History.
12. Heroes of American Democracy.
13. The Call of Blue Waters.

14. Iron and Steel.
15. Shipbuilding.
16. Machine Shop Work.
17. Foreign Trade.
18. Reading Course on Dante.
19. Master Builders of To-day.
20. Teaching.
21. Twenty Good Books for Parents.
22. Agriculture and Country Life.
23. How to Know Architecture.
24. Citizenship and Government.
25. Pathways to Health.
26. Sixty Selected Stories for Boys and Girls.
27. Poetical Literature for Boys and Girls.

If you wish to enroll in this or any other of the courses issued by the Bureau of Education, address your request to The Commissioner, Bureau of Education, Department of the Interior, Washington, D. C., being careful to give the name and number of the course desired. If you live in any one of the following States, instead of returning the application to the Bureau of Education send it to the address given for your State:

Arizona: A. O. Neal, Extension Division, University of Arizona, Tucson, Ariz.

Colorado: Elmore Peterson, Extension Division, University of Colorado, Boulder, Colo.

North Dakota: Albert H. Yoder, Extension Division, University of North Dakota, Grand Forks, N. Dak.

Oregon: Dan E. Clark, Extension Division, University of Oregon, Eugene, Oreg.

South Dakota: John C. Tjaden, Extension Division, University of South Dakota, Vermillion, S. Dak.

Utah: F. W. Reynolds, Extension Division, University of Utah, Salt Lake City, Utah.

Washington: F. F. Nalder, Extension Division, State College, Pullman, Wash.

The bureau awards certificates on completion of each reading course. These courses are not only for children but for adults.

In an address before Rotarians in Education, Washington, D. C., February 24, 1926, Dr. Hubert Work, Secretary of the Interior, said: "A man is nothing more than a possibility. It is his reaction to opportunity that fixes his place in the world."

Here is the opportunity right "at your door." These certificates should be highly prized and ought to arouse quite a little competition in their procurement.



be irrigated. The seepage water resulting from this irrigation must find its way by gravity to the sump of the lake. (Map 2.)

The Klamath drainage district has faithfully performed its terms of the contract in respect both to its payments and to due diligence in prosecution of its agricultural experiment.

What knowledge and experience have been acquired and what utilization has already been made of the lands designated for drainage and irrigation, while complying with the contract, are still insufficient to foretell what degree of success will in the end be attained, or to what extent the former lands of the lower Klamath Lake area will be appropriated for agriculture.

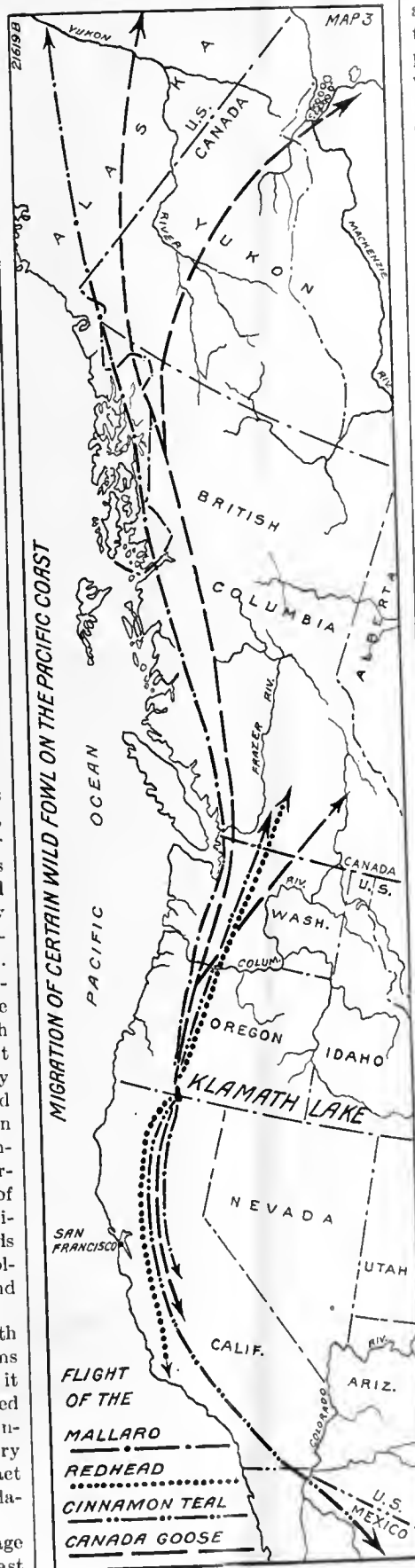
Seldom has the adaptation of crops to soil, consideration of late and early frosts, and drainage, irrigation, and the necessity for drainage of seepage water of offered such difficult problems in combination, as are presented in the lands of the Klamath drainage district. Its solution must therefore be drawn from the advice of agricultural experts and from experience involving time and the expenditure of capital.

That portion of the district composed of peat soils has proved its fitness for pasture meadows and has produced abundant crops of rye and in less degree of other grains, and there is reason to assume that when water level conditions are better understood and controlled, these peat soils will prove profitable for alfalfa. It can be said of these peat soils that the farmers upon them have created an agricultural land asset. It is probably true also that with additional time and experience these assets will increase in value.

Less has been accomplished in experimentation and proof of the value of the soil of the lake bed. It produces, with abundant moisture, abundant weeds. It has produced a vigorous growth of barley and oats which in 1925 was not matured and harvested but fed to pasture. It can be said of this colloidal soil that it is unusual in its chemical and physical character, and we can not cite an example of the successful cultivation of a soil of similar character. In the Sandwich Islands a somewhat similar, but not a similar, colloidal soil has been "planted to cane and with indifferent results."

Inasmuch, therefore, as the Klamath drainage district has performed its terms of the contract with the United States, it becomes the obligation of the United States to respect the terms of the contract. It is, furthermore, a necessary part of good faith to refrain from any act which will impair the credit of the Klamath drainage district.

A condition resulting from the drainage of the marshes is the drying out of a vast



area of peat with its consequent liability to fire. As the development of irrigation proceeds, water from the irrigation canals will diminish this fire risk.

From these facts then, we find that an effort is being made by an organization directed by responsible and experienced cultivators, to cause two blades or more of grass to grow where none grew before. The difficulties are such that time and money are necessary to determine how far the lands under experiment are or are not agricultural lands.

In consideration of the contractual obligations of the two parties of the contract, the Government and the Klamath drainage district, time should be allowed in which to come to a final and fair conclusion.

If the lake bed area is nonagricultural, when it shall have been so demonstrated, consideration of some other use of the lower Klamath Lake bed area will be in order.

#### WILD-FOWL CONSERVATION

In 1908 President Roosevelt issued an Executive order creating Klamath Lake reservation, in order to protect the multitude of varied bird life of lower Klamath Lake, "subject," however, "to the use of any part of the reserved area by the Reclamation Service."

Quoting from the Volt:

"The wild-fowl nurseries of Klamath County are an outstanding feature of the region. Except on the Gulf of Mexico nothing was comparable with the refuges and breeding grounds of the Klamath Lake region. Numerous ducks, including mallards, pintails, canvasbacks, gadwalls, mergansers, cinnamon teal, and ruddy ducks, were among the former inhabitants of lower Klamath Lake. The marshes were also the homes of Canada geese, sandhill cranes, bitterns, coots, and rails. Along the mud flats were avocets, stilts, phalaropes, snipe, killdeer, and other waders. On the lakes were colonies of numberless gulls, night herons, and great blue herons, cormorants, grebes, terns, and pelicans."

Mr. and Mrs. William L. Finley, of the National Audubon Society, than whom no one is better qualified to speak of the former conditions of bird life in this region, say:

"In the past the birds of Klamath County have been a factor in its development. Back in the nineties, when market hunting was in vogue, a hundred and twenty tons of ducks were shipped from this section during one winter season to the San Francisco markets. The plumage of untold thousands of grebes, terns, and other beautiful birds was sent to the

(Continued on page 82)

## Conservation at Lower Klamath Lake

(Continued from page 81)

millinery markets of New York and Paris. The days of the market and plume hunters have passed into the period of the sportsman and tourist. Each year more wild land is brought under cultivation; swamps, ponds, and lakes are drained, forests are cut, and fields fenced. These activities are of great importance to the State. As Klamath County develops, if some attention is paid to nesting, feeding, and resting refuges for our wild birds, their variety and number can be retained even under the change of conditions. Klamath County is one of the great outdoor lands of the West. Conserving its remarkable bird life will prove a valuable future asset for a desirable class of tourists who have money to spend and money to invest."

Now, owing to the drainage of the waters this bird life has almost disappeared.

In recent years the small area of water already described as the remaining portion of lower Klamath Lake or the sump has been the temporary resting spot for a multitude of ducks. So numerous were they in proportion to the diminished lake area that a pollution of the water has resulted

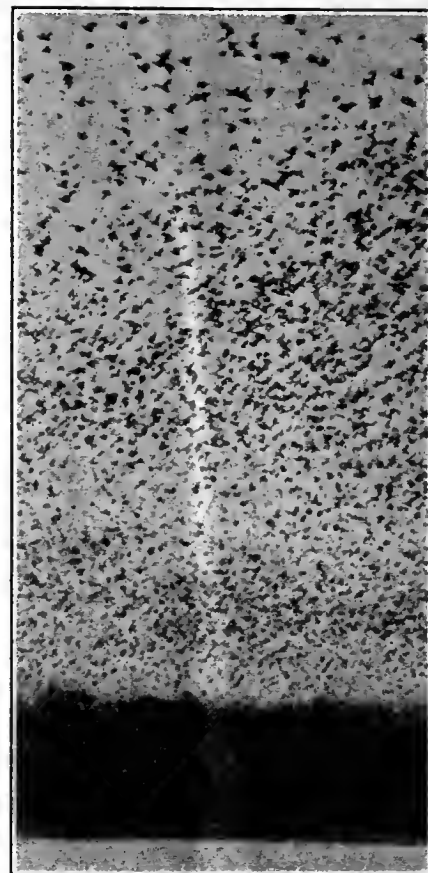
and a disease of the ducks followed. This disease has produced a great mortality of ducks. The accompanying illustration shows a multitude of ducks awaiting a chance to drink and rest upon a water area insufficient for their accommodation.

Such, then, is the importance of lower Klamath Lake for wild-fowl conservation. The interest of the sportsmen of California is involved. The loss of the region for them for the conservation of wild fowl has and will continue to be felt until some other region adapted to the needs of wild-fowl conservation is found and developed.

Agriculture has already become established in Klamath drainage district and independently upon other parts of the peat lands.

Two factors will therefore determine the possible course of wild-fowl conservation: The extent of future agricultural development and the cost involved in the establishment of sanctuaries.

While these questions are unsettled it is proposed to dike that portion which is not now put to beneficial use. Such diking is necessary in order to carry away,



Concentration of ducks caused by drainage of their feeding grounds

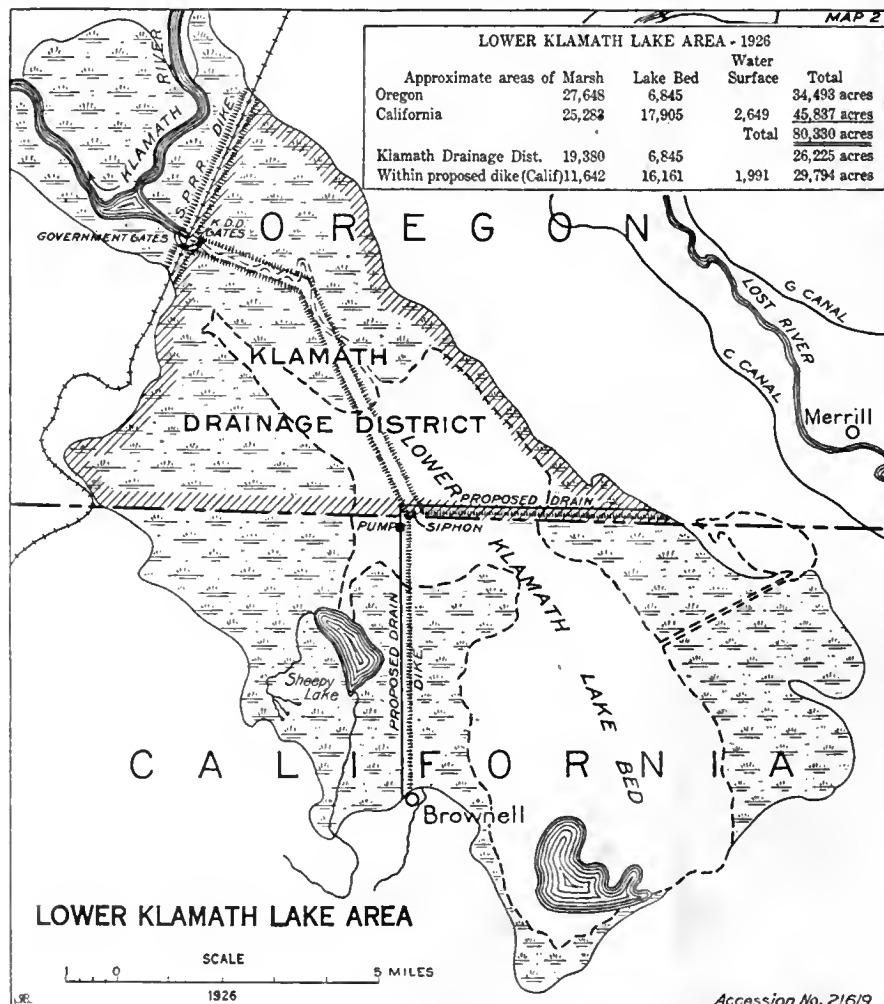
impound, and dispose by evaporation of the seepage water flowing from the Klamath drainage district and to prevent the restored water in the lake from drowning out agriculture in the Klamath drainage district. This seepage water must be pumped over the dike and would become an annual recurring charge against wild fowl conservation.

These two charges taken together probably exceed the expectation of casual estimates of cost, but the conservation benefit which would result would probably, on the other hand, prove very material.

Besides the element of cost the consideration of an accumulating increase of alkali within the dike region should be taken into account.

Pending determination of the course to be followed at lower Klamath Lake and irrespective of its conclusion, prudence would seem to dictate an effort to find and develop other areas for sanctuaries within the United States and within the line of flight (map 3) where the cost as compared with the benefit would promise equal or better results than now appear probable at lower Klamath Lake.

If an alternative area or areas prove available and besides them a portion of the lower Klamath Lake is developed, conservation would not then provide the rising generation in California with a supply of wild fowl equal to that of preceding generations.



## Cotton Production on the Projects

*Cotton grown on the Federal irrigation projects*

Project	Acreage	Unit of yields	Yields				Value	
			Total		Average per acre		Total	Per acre
			Lint	Seed	Lint	Seed		
Salt River.....	\$2,780	Lb.....	31,076,267	62,152,533	375	750	\$8,888,511	\$107.37
Yuma.....	33,408	Lb.....	13,309,942	26,619,884	398	796	3,061,286	91.60
Orland.....	64	Lb.....	8,333	16,667	130	260	5,625	87.90
Carlsbad.....	18,342	Lb.....	4,765,760	9,280,710	260	506	1,210,879	66.00
Rio Grande.....	81,373	Lb.....	33,851,168	55,690,000	416	684	8,226,917	101.10
Totals and averages.....	215,967		83,011,470	153,759,794	384	712	21,393,218	98.13

**M**ORE than one hundred and sixty-six thousand 500-pound bales of cotton, valued at \$21,393,000, were grown last year on five Federal irrigation projects.

A recent compilation shows that cotton was grown on 215,967 acres on the Salt River project, Arizona; Yuma project, Arizona-California; Orland project, California; Carlsbad project, New Mexico; and Rio Grande project, New Mexico-Texas. The yield from this acreage amounted to 83,011,470 pounds of lint and 153,759,794 pounds of seed, an average of 384 pounds of lint and 712 pounds of seed per acre. The total value of the crop amounted to \$21,393,218, or \$98.13 per acre. The value of the cotton

**M**ORE than 8,000,000 bushels of white potatoes, valued at \$8,711,000, were grown last year on the Federal irrigation projects.

A statement compiled recently shows that although the 33,170 acres cropped to potatoes on the projects in 1925 was 4,500 acres less than the area in 1924, the yield in 1925 was more than 1,320,000 bushels greater and the value more than \$5,000,000 greater than in the preceding year. The value of the crop per acre amounted to \$90.93 in 1924 and was nearly trebled in 1925, amounting to \$262.61 per acre.

Projects producing more than a million bushels of potatoes in 1925 were the Uncompahgre, Colorado; the Boise and Minidoka, Idaho; the North Platte, Nebraska-Wyoming; and the Yakima, Washington. The last named led all the others with a production of 2,411,870 bushels from 8,383 acres, valued at \$3,135,431, or nearly \$375 an acre. Returns of more than a million dollars for this crop were also received on the Minidoka and North Platte projects.

crop represented more than 27 per cent of the total value of all crops grown on the Federal irrigation projects during 1925.

## Potatoes on the Reclamation Projects

*POTATOES ON RECLAMATION PROJECTS, 1924-1925*

Project	Year	Acreage	Yield	Value	Per acre value	Per acre yield
			<i>Bushels</i>			<i>Bushels</i>
Salt River.....	1924	242	20,167	\$36,300	\$150.00	83.3
	1925	305	40,667	48,800	160.00	133.3
Yuma.....	1924	0	0	0	0	0
	1925	174	50	90	60	33.3
Orland.....	1924	4	500	900	225.00	125
	1925	5	665	1,200	240.00	133
Grand Valley.....	1924	744	98,230	85,924	115.48	132
	1925	791	122,555	162,885	206.00	155
Uncompahgre.....	1924	7,624	1,214,380	334,587	43.88	159.2
	1925	5,154	1,089,990	948,249	183.98	211.5
Boise.....	1924	5,103	754,373	297,835	54.44	147.8
	1925	2,583	1,156,346	444,004	171.90	447.6
King Hill.....	1924	238	24,840	14,544	61.10	104.3
	1925	143	20,277	18,007	125.60	141.4
Minidoka.....	1924	6,551	1,177,949	588,974	89.90	179.8
	1925	6,945	1,682,115	2,270,855	326.97	242
Huntley.....	1924	21	1,610	1,611	76.71	76.6
	1925	26	2,723	4,734	181.92	104.3
Milk River.....	1924	56	6,616	5,916	105.64	118.1
	1925	106	17,862	33,316	323.73	159
Sun River.....	1924	219	17,327	13,350	60.95	79.1
	1925	237	32,620	48,930	206.45	137.6
Lower Yellowstone.....	1924	110	11,650	6,990	63.54	105.9
	1925	128	13,355	20,032	156.50	104.3
North Platte.....	1924	6,351	1,011,460	406,017	63.92	159.2
	1925	5,677	1,092,801	1,147,440	202.12	192.4
Newlands.....	1924	273	22,630	22,633	82.89	82.8
	1925	152	20,533	27,720	182.36	135
Carlsbad.....	1924	0	0	0	0	0
	1925	7	300	380	54.29	42.8
Rio Grande.....	1924	0	0	0	0	0
	1925	3	450	720	240.00	150
Umatilla.....	1924	66	6,290	6,917	104.80	95.3
	1925	108	10,150	12,383	114.66	94.2
Klamath.....	1924	450	46,560	41,904	93.12	103.5
	1925	818	95,491	128,912	157.59	116.7
Belle Fourche.....	1924	81	5,340	5,330	65.91	65.9
	1925	93	12,206	18,309	196.87	131.4
Strawberry Valley.....	1924	414	42,498	31,874	76.99	102.6
	1925	227	27,635	38,185	168.22	121.7
Okanogan.....	1924	28	3,695	4,434	158.35	132
	1925	21	2,010	3,618	172.29	95.7
Yakima.....	1924	7,494	2,098,690	1,443,698	192.64	280
	1925	8,383	2,411,870	3,135,431	374.14	287.7
Shoshone.....	1924	1,601	169,180	75,490	47.15	105.6
	1925	1,257	202,002	196,630	156.43	160.7
Totals.....	1924	37,670	6,733,985	3,425,237	90.93	178.7
	1925	33,170	8,054,673	8,710,830	262.61	242.8

<sup>1</sup> 17.6 acres of certified seed

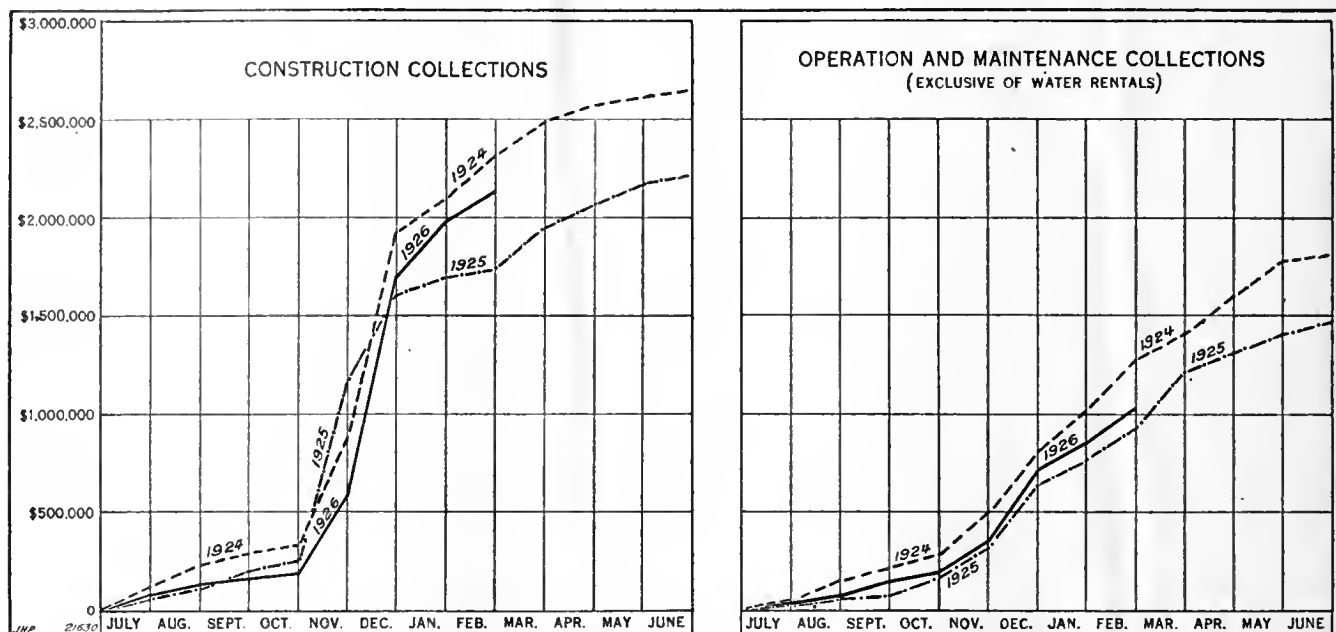
The value of the crop on the Salt River and Rio Grande projects amounted to more than \$8,000,000 each and to more than \$100 an acre. For the first time cotton was grown on the Orland project in California, where 64 acres were planted as an experiment. From this acreage cotton to the value of \$5,625 was grown, or an average of \$87.90 an acre.

The accompanying table shows the statistics in detail for the five projects.

**A**LL of the rights of way for the first 4 miles of the main canal, Kittitas division of the Yakima project, have been secured by the Kittitas Irrigation District, and on March 31 a contract was signed by the president and secretary turning over these rights of way to the United States at a total cost of \$6,615. The work of securing options and deeds for the remainder of the right of way for the canal has been practically completed.



## Place Your Project in the "Blue Ribbon" Class



Collections for construction and operation and maintenance, fiscal years 1924, 1925, and 1926

THE reclamation policy of the Federal Government was adopted as the result of the act of June 17, 1902, which provides that the proceeds from sales and leases of the public domain should be placed in a special fund to be used for the construction and operation and maintenance of irrigation works for the reclamation of arid lands, the cost of construction and operation and maintenance to be returned to the fund through assessments against the lands benefited.

### SOURCE OF THE FUND

During the first 10 years of operation under the reclamation law almost all the money available for the reclamation of arid lands was derived from the sale and lease of the public domain. Of the money available for reclamation from 1902 to 1925, 72 per cent was derived from the sale of public lands, oil-leasing royalties, etc., and 28 per cent from repayments by the lands benefited and from incidental operations by the Bureau of Reclamation. The receipts from the sale of public lands have greatly decreased since the inauguration of reclamation. There was deposited to the fund from this source during the fiscal year 1925 only \$760,000 as compared with the maximum annual deposit of \$9,400,000 in 1908; likewise there has been a decided decrease in the receipts from oil-leasing royalties which were made available for reclamation by the act of February 25, 1920.

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### Federal irrigation projects: Comparative collections

State	Project	Construction				Operation and maintenance			
		February 1925	February 1926	Fiscal year 1925 to Feb. 28, 1925	Fiscal year 1926 to Feb. 28, 1926	February 1925	February 1926	Fiscal year 1925 to Feb. 28, 1925	Fiscal year 1926 to Feb. 28, 1926
		Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.
Arizona.....	Salt River.....			599,326	643,862				
Arizona-California.....	Yuma.....	10,902	31,929	327,835	321,967	116,729	112,895	245,210	178,504
California.....	Orland.....	3,049	2,227	19,463	71,108	2,690	563	22,412	31,499
Colorado.....	Grand Valley <sup>1</sup> .....					1,455	2,939	26,873	36,420
	Uncompahgre.....	622	9,251	23,846	62,914	4,474	8,571	67,761	87,882
Idaho.....	King Hill.....							71	161
	Minidoka:								
	Gravity.....	11,208	10,274	55,677	86,198				
	South side pumping.....	1,319	3,902	28,563	61,693	4,920	2,267	34,257	44,038
	Jackson Lake.....		1,102	31,646	39,982			9	111
Idaho-Oregon.....	Boise.....	861	222	141,627	114,167	11,804	734	68,448	118,191
Montana.....	Huntley.....	319	665	16,529	20,339	597	584	25,047	26,348
	Milk River <sup>1</sup> .....					4,949	716	12,464	10,512
	Sun River:								
	Fort Shaw.....	154	506	6,123	6,023	571	547	6,198	6,308
	Greenfields <sup>1</sup> .....					1,237	686	10,513	12,304
Montana-North Dakota.....	Lower Yellowstone.....	64	209	2,626	10,516	185	601	2,626	10,516
Nebraska-Wyoming.....	North Platte:								
	Interstate.....	48	868	24,090	19,126	274	1,599	36,472	36,042
	Fort Laramie <sup>1</sup> .....							27,068	33,106
	Storage.....	88	3,207	30,945	17,159	706	485	6,217	2,584
	Northport.....							22,748	23,381
Nevada.....	Newlands.....	660	4,982	30,195	45,533	4,687	7,602	70,854	99,155
New Mexico.....	Carlsbad.....	5,950	2,939	63,229	43,136	5,433	3,143	60,683	33,921
New Mexico-Texas.....	Rio Grande.....			33,850	118,194		7,088	48,499	72,683
Oregon.....	Umatilla.....			5,730	257	2,939	30	17,475	7,900
Oregon-California.....	Klamath.....	189		58,297	31,854	4,619	246	49,158	36,014
South Dakota.....	Belle Fourche.....								
Utah.....	Strawberry Valley.....	9,352	12,158	62,404	80,620	5,855	6,055	23,615	29,560
Washington.....	Okanogan.....		13	221	223	37	3,510	895	10,007
	Yakima:								
	Sunnyside.....	1,472	54,571	45,413	108,059	3,458	24,089	14,283	56,396
	Tieton.....	5,997	9,986	94,523	135,678	4,149	5,856	62,093	61,611
	Storage.....	60	60	20,375	75,615			18,050	15,800
Wyoming.....	Shoshone:								
	Gariand.....	399	3,415	8,199	21,866	1,882	7,007	11,282	31,623
	Frannie.....							446	
Total.....		52,713	152,386	1,730,732	2,136,089	183,650	197,813	991,718	1,112,577

<sup>1</sup> Project on water rental basis.

## Place Your Project In "Blue Ribbon" Class

(Continued from page 84)

### THE FUND MUST REVOLVE

To perpetuate the Federal reclamation policy the revolving feature of the fund must be accelerated by the water users assuming their financial responsibility to the Government. During the period immediately following the readjustment of repayments under the extension act of August 13, 1914, to June 30, 1920, payments by the water users were generally satisfactory. Beginning with the fiscal year 1921, however, the unpaid charges for construction and operation and maintenance increased from \$1,200,000 to the staggering total of \$9,170,000 on June 30, 1925. This falling off in collections resulted in part from the operations under the various relief laws. While some water users have made heroic sacrifices to pay their debts, others, because of the blanket feature of the relief and an absence of necessary individual scrutiny, have been chronic evaders, not only refusing to pay charges they were amply able to meet but using their influence to induce other settlers to oppose these payments.

### BLUE RIBBON WATER USERS

Many water users take pride in raising blue ribbon stock, cattle, pigs, and poultry; others in growing blue ribbon agricultural and horticultural products and making display at the annual county and State fairs. Such efforts are commendable and will go far to perpetuate reclamation. The success of a project, however, can not be measured entirely by its production. The financial showing of the return of the Government's investment must be considered. This can be accomplished by individual and joint financial responsibility to the Government on the part of the water users' associations and irrigation districts.

The accompanying tabulation and graphic charts show the results for the fiscal years 1924, 1925, and 1926.

A NUMBER of carloads of potatoes from the Shoshone project have been sold at fancy prices. One farmer sold a carload at \$4 per hundredweight, receiving more than \$1,400 for the car. A carload of second-cutting alfalfa from the Frannie division sold recently on the Kansas City market at \$25.50 per ton, bringing \$12.50 per ton net to the grower. This is stated to be the highest price paid this winter at that market for Wyoming hay.

## Good Progress Made at McKay Dam

WORK on placing the concrete paving on the upstream face of McKay Dam, Umatilla project, Oregon, was resumed in March after an interval of non-activity on this feature since October, 1925. During this latter month about 2,000 cubic yards of the paving had been placed at the upstream toe of the dam, because there was very little flow of water in McKay Creek at that time to interfere with the paving operations. The concrete placed then brought the top above high water and permitted the early resumption of paving work this spring. The work was planned in this manner to permit the embankment to settle and compact as much as possible before placing the remainder of the concrete paving. A section for the concrete paving measuring 80 feet up and down the  $1\frac{3}{4}$  to 1' upstream slope was prepared for the full length of the dam at this elevation, which measured about 1,500 feet. A 24-foot narrow gauge track was constructed along the slope at the top of the section, and the concrete mixer was

placed on a level with the track at the left abutment. Sand and gravel were stocked in piles near the mixer, which was charged by hand labor with the use of wheelbarrows. Cement was received from the mill at Lime, Oreg., in shipments arranged so that the cement could be unloaded from the cars at Sparks and hauled directly to the mixer at the dam, saving a rehandling charge. The concrete was mixed in a motor-driven  $\frac{1}{2}$ -yard Jeager mixer, the actual mixing being accurately timed at one and one-fourth minutes per batch. The mixed concrete was hauled from the mixer along the slope in  $\frac{1}{2}$ -yard cars by Ford automobile engines mounted on car trucks. The mixed concrete was chuted down the slope and placed in vertical panels 12 feet wide. Alternate panels were placed first, and after these were sufficiently set to work on, the intermediate panels were placed.

Forms of 2-inch lumber were placed on top of the reinforcing steel at the proper intervals to form the panels, the top of the forms being set to the finished surface of the concrete. Six men were used in placing the concrete after it left the chute on the slope. The chutes were made in about 8-foot sections and were removed as the concrete paving was brought up the slope. Four good husky men were required in bringing the finishing board up the slope over the freshly placed concrete. The finishing board was made of two 2 by 6s formed in the shape of an L and rested on top of the wooden forms previously mentioned. Four additional men are used in finishing with wooden trowels. The finishers use an average of 1 cubic foot of mortar, in addition to that in the concrete, for finishing every 80 square feet of surface. After pouring, the concrete is protected from the direct rays of the sun for at least 24 hours after which time it is kept damp by sprinkling for 10 days. During the month 3,600 cubic yards of concrete were placed at a unit cost of \$14.70 per cubic yard. This cost is comparable with the estimate of \$15.25 per cubic yard. Six sacks of cement per yard of concrete were used during the month. The sand was shipped in from Hermiston, a distance of 42 miles, by railroad, and hauled by truck  $2\frac{1}{2}$  miles to the mixer. The cost per yard of sand at the mixer is \$2.50. Gravel was washed, crushed, and screened in the valley about 1 mile upstream from the dam. The gravel was charged out at \$1.80 per cubic yard.

## Farm Population Shows Decrease During Year

A continued decrease in farm population in the United States is reported by the Department of Agriculture, which estimates that there were 479,000 fewer people on farms January 1 this year than on January 1 a year ago.

The department estimates the farm population at 30,655,000 on January 1, 1926, compared with 31,134,000 on January 1, 1925, a decrease of 1.5 per cent. These figures include all men, women, and children living on farms.

The movement from farms to cities, towns, and villages in 1925 is estimated at 2,035,000, and the movement to farms at 1,135,000, a net movement away from farms of 901,000. Births on farms during 1925 are estimated at 710,000, and deaths at 288,000, leaving a natural increase of 422,000 which reduced the loss due to cityward movement to 479,000.

All geographic divisions of the country showed net decreases in farm population during the year, the Mountain division showing a decrease of 3.9 per cent and the Pacific division 1.6 per cent.

## Irrigation Notes from New South Wales, Australia

*Irrigation officials in the land "down under" are coping with much the same problems as the United States is attempting to solve on the irrigation projects of the West—Aided and directed settlement holds a prominent place*



Burrinjuck dam, Murrumbidgee Irrigation Area, New South Wales, Australia. General view of dam and spillways during the flood of May, 1925

THE Annual Report of the Water Conservation and Irrigation Commission of the State of New South Wales, Australia, for 1925, has many things of interest to lawmakers, managers of irrigation works, and those seeking to make homes on irrigated farms. It shows that the conditions which affect reclamation in this country are operating in much the same fashion in Australia, where the conditions are very similar to those of the Pacific Coast States. A few extracts from this report, which have a direct relation to our own problems, are worth a place in this issue of the ERA.

The Murrumbidgee project, the largest single reclamation project in New South Wales, is on the Murrumbidgee River. Its flow is regulated by a dam placed in the channel of the stream, which creates a reservoir which backs the water up 45 miles and impounds about 1,000,000 acre-feet. The dam is of concrete masonry, arched in form, and about 250 feet in height. The design aimed to provide a spillway large enough to carry the highest floods, but on May 27, 1925, all previous records and all previous computations were set at naught by heavy rains on the headwaters of the river, which brought down to this reservoir a discharge estimated at more than 340,000 cubic feet per second. The maximum discharge of the Colorado River at Yuma is only 240,000 cubic feet per second, and this discharge caught the Murrumbidgee Dam with the reservoir full. The result was that over 150,000 cubic feet a second passed down the spillways, which were

inadequate, and the water rose till it topped the dam to a depth of 3.33 feet above the parapet walls. The accompanying illustration shows the appearance of the flood at about its greatest discharge over the dam. The structure stood the test. No material damage was done.

The Murrumbidgee project has a total area of about 250,000 acres, larger than any single enterprise in this country except the Imperial Valley. It is in the heart of a great pastoral district with a very limited local market for its products, the chief market being Sydney, about 200 miles distant, and which has a population of a million people.

### HELPING THE SETTLERS

To secure settlers for this area the state has, from the first, pursued a policy of helping to prepare the land for cultivation and of making certain advances to help settlers of small capital build their houses and do whatever was needed to make the farm self-supporting. An act of 1920 provided an appropriation of \$4,200,000 to help improve farms for returned soldiers. An act passed in 1923 provided another appropriation of over \$2,000,000 and in another in 1924, \$1,562,000, or a total since 1920 of \$7,787,000. The total balance sheet of the Murrumbidgee project shows that advances to settlers to help them improve and equip their farms have amounted to more than \$10,700,000.

The law under which these advances are made does not require any capital of soldiers, but does require the civilian

settlers to have not less than \$1,500 capital of his own, and the results have been much more satisfactory with the civilian than with the soldier settler. The hard times that have rendered adjustments necessary in the United States have operated in much the same way in Australia. It has been found necessary to extend the term of repayment of advances to help improve and equip farms from 20 years, which was the fixed maximum of the original act, to from 20 to 40 years, according to the classification of the land, the plantings, and the class of farm in question.

This extension of time in Australia does not involve any loss to the Government as interest is required. This interest has been reduced so that the maximum charge is  $5\frac{1}{2}$  per cent. Before that it was whatever the commercial rate might be. A provision has been incorporated in the law just amended, which corresponds to a provision included in the bill now before Congress for adjustment of settlers' debts on Federal reclamation projects, that is, it provides for a postponement of installments of principal and interest for a period not to exceed five years, which is the same provision as is found in the omnibus adjustment bill in the United States. The Australian act provides for transfers from farms found unsuitable for irrigated culture, to lands that are suitable. That provision has been recently incorporated in the Federal reclamation act.

(Continued on page 87)

## Irrigation Notes From New South Wales

(Continued from page 86)

### INABILITY TO GET SETTLERS

In 1923 a contract was entered into between England and Australia which provided for advances to settlers on irrigated farms, ranging from \$3,000 to \$10,000. These advances were to be made on very liberal terms and at low rates of interest. The purpose was to attract settlers from Great Britain to the farm lands of the different Australian States. As the Murrumbidgee area is a region in which the climate permits all of the crops which can be grown in southern California, it was thought that there would be a rapid movement of people there, but the last annual report of this commission shows that although the fullest information has been made available, the response has been very meager, not only from settlers from England but from home seekers in Australia. During the last year there was a slight falling off in the total number of settlers on this project, due as the report states, to the number of discharged soldiers who have given up their holdings.

### COOPERATIVE BUSINESS ENTERPRISES

In addition to the advances made to help settlers improve and equip their farms, it was found necessary to do something to help create markets for the surplus products of settlers which would not stand shipment to Sydney or other distant points, and one of the efforts made in this way was the building by the Government of a cooperative fruit cannery at one of the principal centers of the project. This was operated for a number of years at a loss, but for 1925 there was a profit of \$925, after allowing \$86,000 for interest and \$45,000 for depreciation.

Commissioner Mead visited Australia in 1923 to act as an adviser in the development of this project, and among other things recommended some cooperative arrangement for the sales, in advance, of the alfalfa crops, the idea being that the great pastoral interests of the country would find it to their advantage to contract for the alfalfa hay needed to carry them through periods of drought, and through such advance contracts, such as are made in the United States in the purchase of sugar beets, the growing of alfalfa would be stabilized, the settlers would be able to equip their farms with the necessary machinery to harvest it effectively, and prices from year to year would be stabilized. The report of the commission notes that the proposed demonstration is to be carried out.

## Aided Settlement in Esthonia

**I**N a recent issue of the International Labor Review, the subject of the social aspects of land reform in Esthonia is discussed by M. Martna, member of the State assembly. The following interesting comments on aided and directed settlement are taken from this article:

"In influential circles the view is held that the basis of the material prosperity of the country is agriculture, and especially small farming. Hence the effort to set the settlers firmly on their feet and at the same time to help the peasants on the old farms.

"The first necessity is that the land should be transferred to the settlers on

the most favorable terms possible. They can lease their holdings, or buy the freehold at a reasonable price. Specially distinguished soldiers, disabled soldiers who have lost more than 40 per cent of their working capacity, and the survivors of deceased soldiers get the land rent free for their lifetime. The rent, or interest on the purchase price, is fixed at a reasonable rate. The settlers have also the privilege of obtaining expropriated implements or stock at special prices. They have been granted loans for the purchase of stock and equipment to a total of about \$672,000, and building loans to upwards of \$1,480,000, the rate of interest being 6 and 2 per cent, respectively. Loans for the purchase of stock and equipment have to be repaid in six years; building loans are repaid by 29 yearly payments of 3 per cent for wooden buildings and by 40 yearly payments of 2 per cent for stone buildings, in addition to the interest."

The state has also made loans for building cooperative dairies, amounting to \$295,700. In addition the state has guaranteed credits for marketing agricultural produce of \$322,580 in Sweden and \$26,880 in Finland.

### STARTING THE SETTLER RIGHT

The public but unofficial organizations with which the Ministry of Agriculture collaborates are the Central Union of Farmers and the Settlers' Association. The program of the Farmers' Union extends to every branch of practical agriculture, including the use of machinery, accountancy, and cooperation. The union has a permanent staff of 86 and gives practical advice to farms and cooperative societies and in public meetings. The Settlers' Association has similar aims, principally among the new peasants. The association does not attach much importance to courses and lectures, but expects more from individual instruction and from organizing single farms. The association tries to find suitable settlers who declare their readiness to work their farms in strict accordance with the instructions given by association instructors. These farms are intended to serve as model farms and as educational examples. The work of the cultivation experts is to prepare plans for improvement schemes, drainage, laying out of farms, to determine suitable rotation of crops, etc. Both organizations are subsidized by the state.

## Sun River Project Dam Named for Former Senator

*A tribute to the memory of former Senator Paris Gibson, of Montana, will be paid to him by designating as "Gibson dam" the proposed storage dam on the Sun River irrigation project in Montana.*

*Former Senator Gibson, who died at an advanced age a few years ago, represented one of the best types of the western pioneer. He was born on July 1, 1830, graduated from Bowdoin College in 1851, and in 1858 built the first flour mill and the first woolen mill in Minneapolis. In 1879 he settled at Fort Benton, and in 1882 founded the city of Great Falls, Mont. He was active in the State Constitutional Convention, was a member of the Montana Senate in 1891, and United States Senator from 1901 to 1905.*

*The tentative plans for the new dam, which will bear the Senator's name, call for a masonry structure more than 200 feet in height, with a crest length of 820 feet, and a volume of 195,000 cubic yards. The area of the reservoir behind the dam will amount to 1,360 acres, with a capacity of 105,000 acre-feet.*

*The question of naming the dam after Senator Gibson was brought to the attention of the Governor of Montana and the Senators and Representatives from that State, with the result that they were unanimous in approving the suggestion.*

## The Needs of the South

*Extract from an interesting letter from David R. Coker, farmer and plant breeder of Hartsville, S. C.*

THE State of South Carolina in the recent session of its legislature passed a bill appropriating \$25,000 to advertise the State. The literal meaning of "advertise" is to "turn toward." How can this best be accomplished for agriculture? By demonstrating to our own people and to possible settlers that this is a favorable section for happy and prosperous home life on the farm. This can be definitely proven only by showing the present and prospective farmer actual demonstrations of profitable and happy agricultural conditions.

We must have an intensive agriculture which will afford something more than a

living wage, and arrangements must be made by which expert farmers who know certain types of intensive agriculture can come here into good social surroundings and receive the competent instruction necessary for their adaptation to our climate and soil and to correct methods of culture and fertilization under southern conditions. They must be able to purchase good land at reasonable prices and on long time, and they must be settled in communities where they can learn from each other and from our locally trained farmers and can cooperate together in the sale of their perishable and semiperishable products.

The type of agricultural settlement I have in mind is illustrated by the Durham settlement in California, the settlements of Mr. Faast and Mr. Edmonson in northern Wisconsin, and those colonies developed by Mr. Hugh MacRae near Wilmington, N. C. Into these settlements have come people of widely varying education and knowledge of agricultural subjects. They have been enabled to buy land on long time at reasonable rates of interest; they have received information, counsel, and in some cases financial help from the organizations or individuals directing these settlements; and they have all been able to learn from each other and cooperate together in an effective manner, which would be impossible under more isolated conditions. Dairying, chicken farming, and fruit and vegetable growing lend themselves particularly to this type of settlement, but the production of the finest grades of cotton, tobacco, and feed crops would fit in with an intensive agriculture for a proportion of the acreage in rotation with other crops.

## Uncompahgre Plans Cooperative Marketing

THIRTY-FIVE or more earnest men, all interested in the problems of cooperative marketing, attended a recent meeting at Montrose, Colo., on the Uncompahgre project.

H. A. Ireland, county agent for Montrose County, stated that the meeting had been called in response to a generally expressed desire that some kind of organization be effected having as its aim the establishment of an orderly system of marketing in keeping with the spirit of the times, and one which would win and hold the support of the interested farmers, in whose behalf the movement was being initiated.

The meeting was also addressed by Andrew Weiss, assistant director of reclamation economics, and Dr. B. O. Aylesworth, State director of markets, who suggested the organization of a county advisory council to be composed of two members from each of the principal agricultural enterprises. The function of such an advisory council would be to supervise new organization processes, to determine the readiness and advisability to organize and to affiliate with related cooperatives, to assist in the organization of women's clubs, boys' clubs, and girls' clubs, to assist in the adjustment of disputes

arising within or between locals and between shippers and carriers, and in general to foster the cooperative movement in every legitimate way and to fight the encroachments of hostile forces.

Following Doctor Aylesworth's remarks a temporary advisory council was formed, representing the bee keepers, hay growers, poultry, fruit, potatoes, beets, onions, dairy products, grain, swine growers, beef, cattle, and sheep. A temporary executive committee was elected, composed of T. C. Anderson, T. W. Monell, and Harry Monell. Plans were made for the formation of a permanent advisory council in the near future.



Concrete-lined lateral on the Yuma project, showing a steel water-right gate and safety overflow wasteway.



## Law Notes of Interest to the Irrigationist

*Prepared by the District Counsel and others*

### MANDAMUS TO COMPEL ASSESSMENTS OF TAXES BY IRRIGATION DISTRICTS

SECTION 7326, Oregon Laws, provides that irrigation district bonds and the interest thereon and all payments due or to become due to the United States under any contract between the district and the United States \* \* \* and all obligations for the payment of money authorized and incurred under the act shall be paid by revenue from annual assessments upon the land in the district. Section 7328 provides that the board of directors of the district shall, on or before the first Tuesday in September each year make a computation of the whole amount of money necessary to be raised by the district for the ensuing year for any and all purposes whatsoever in carrying out the provisions of the act, including estimated delinquencies on assessments. Section 7331 provides that in case of neglect or refusal of the board of directors to make the assessment and levy, then such assessment and levy shall be made and equalized by the county court.

In the case of *Kollock v. Barnard et al* (242 Pac. 847), action was brought in the

Supreme Court of Oregon by the holder of a bond of the district, on behalf of himself and others similarly situated, to compel assessments to meet interest due on the bonds during 1926 and the principal of such bonds as matured in 1926. It was admitted that the board of directors and the county court had failed to make sufficient levy to cover the interest and principal of such bonds. The court held that the holders of the bonds were without other adequate legal remedy, and that mandamus would lie to compel the levy of a tax required by a mandatory statute. Mandamus issued.—*R. J. C.*

#### *Payment of adjusted compensation and furnishing quarters, etc., to employees*

[(Extracts from) An Act Making appropriations for the Treasury and Post Office Departments for the fiscal year ending June 30, 1927, and for other purposes. (Approved March 2, 1926, 44 Stat. —).]

\* \* \* \*  
*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, \* \* \**

SEC. 2. Those civilian positions in the

field services under the several executive departments and independent establishments, the compensation of which was fixed or limited by law but adjusted for the fiscal year 1925 under the authority and appropriations contained in the Act entitled "An Act making additional appropriations for the fiscal year ending June 30, 1925, to enable the heads of the several executive departments and independent establishments to adjust the rates of compensation of civilian employees in certain of the field services," approved December 6, 1924, may be paid under the applicable appropriations for the fiscal year 1927 at rates not in excess of those permitted for them under the provisions of such Act of December 6, 1924.

SEC. 3. The head of an executive department or independent establishment, where, in his judgment, conditions of employment require it, may continue to furnish civilians employed in the field service with quarters, heat, light, household equipment, subsistence, and laundry service; and appropriations for the fiscal year 1927 of the character heretofore used for such purposes are hereby made available therefor: *Provided*, That the reasonable value of such allowances shall be determined and considered as part of the compensation in fixing the salary rate of such civilians.

Approved, March 2, 1926.



Holstein dairy herd on the Shoshone project, Wyoming

## The Tieton Project's Future

*Extracts from address by H. M. Gilbert, President Tieton Water Users' Association*

THE Tieton project, Washington, is primarily and almost unanimously an orchard project. The future value of all our lands will virtually be what they are worth to produce fruit. The unequaled keeping quality, the fine texture, the large production of higher grades, the comparative freedom from pests, all unite to insure that the Tieton project shall be the leading fruit project of the Northwest. In all my 25 years' experience growing fruit I have never seen so promising a future as the next 10 years promise to be, and in this light I hate to see hundreds of our water users losing or giving up their lands.

Let me give you the logic of the situation as I see it. Nearly all other fruit projects of the Northwest have reached or passed their maximum production. With our fruit markets, home and foreign, rapidly increasing and expanding; with our storage facilities creating new demands and new markets for our pears and apples, almost the year round, our fruit demand seems certain to increase. Most of our Northwest orchards running from 12 to 18 years of age are passing or have passed their maximum of high quality production. The Tieton presents practically the only large area of high-class growing orchards and unplanted high-class orchard lands in the Northwest. But for our inadequate water supply, all our orchard lands would be easily worth from \$1,000 to \$1,500 per acre. Why, then, should we hesitate to pay \$30 per acre additional for a sufficient water supply, especially if such additional cost is spread over 20 years or placed at the end of our present payments?

### RECLAMATION CONQUERS DESERT

Considerable criticism has been made of reclamation. Much of this criticism is unjust, narrow, and whimsical. Reclamation, taking the wasting torrents, destructive floods, and drifting snows of winter, storing them in lakes and reservoirs, and, the following summer, building homes, productive farms, and orchard, with them, will ever challenge the enthusiasm of men, be they easterners or westerners. Reclamation, with all our bungling, has conquered much of the Great American Desert. Reclaimed desert in the Yakima Valley alone this single past year has produced 20,000 carloads of perishable freight for railroad freight earnings and for the markets of the

world. With the return from the 20,000 carloads we will buy many thousand carloads of materials and supplies to build better homes and better cities and more productive farms to increase our freight-earning tonnage next year. Reclamation in the Yakima Valley alone makes an annual market for thousands of automobiles, trucks, tractors, machinery, fabrics, books, magazines, life insurance and a thousand other products of the East.

### Big Money Crops Put Yakima in Good Shape

*A recent editorial in the Yakima Daily Republic states that nearly 2,000 cars of Yakima products went out of the valley during March to various markets. Most of the shipments were of apples. Nearly all the rest were potatoes. "These 2,000 cars will bring back a lot of money. Last year's production in the valley probably broke all records, and it has been sold out at good prices. By the time we have cleaned up it will be found that our farmers are in unexpectedly good shape."*

The East is greater, America is greater, because of the West, the reclaimed West! No one doubts the wisdom of the homestead act. Many of you have seen the winning of the West by the homesteader. It was a great victory for the West, a greater victory for the East, and a still greater victory for America! But now there is no new West except as reclamation creates it. If the narrow enemies of reclamation, or narrower friends of reclamation, persist in destroying reclamation it will mean crippling America, stagnation in the West, and no expanding markets for the East. Without reclamation our young men must find a new West under a foreign flag, in South America or Canada.

### TIETON WILL REPAY EVERY DOLLAR

Destroy reclamation and you destroy expansion. The East has thrived on the growth of the West. The West finds its markets in the East; they are not antagonists. They are comrades in the great adventure of building a greater America.

America needs more reclamation, not less. Reclamation supplements our national wealth. It insures a food supply in years of drouth. It insures abundance of fruits for the Nation's health. Reclamation is a way of enlarging America making new land for new homes from the output of volcanoes.

I have full confidence, with reasonable consideration by Secretary Work and extension of payments for those water users who were caught in the great agricultural depression after the war, that the Tieton project will repay every dollar expended by the Government in its construction and that the Tieton project will be the best argument in the Northwest for the wisdom of national reclamation.

### Big Yakima Valley Crops Bring Money to Growers

Up to April 2 a total of 26,482 cars of produce had been rolled from the Yakima Valley for the 1925-26 season, or slightly more than the amount which had been moved by April 1 of the big 1923 season, according to the Yakima Valley Traffic and Credit Association.

Up to the beginning of the month 12,687 cars of apples had been shipped, leaving about 2,570 cars in storage. There were, however, still three months for the apple holders to sell their produce, and if sales continue at the rate of the past few weeks, the entire crop should be cleaned out by June 1.

Additional shipments this season have been made up largely of potatoes and pears. Already 6,359 cars of potatoes have left the valley and there are still some 700 or 800 cars to go at prices which will put many a grower on easy street.

The shipment record of a recent week reads as follows: 335 cars of potatoes, 306 cars of apples, 16 of pears, 4 of onions, and 2 cars of vegetables, a total of 663 cars of products.

Without question, 1925 was a very prosperous year in the Yakima Valley.

### Orland Drought Broken After 44-Day Dry Spell

The drought on the Orland project, California, which had extended over a period of 44 days, was broken on April 4 by heavy rain. Up to noon of the following day the precipitation amounted to 1.97 inches. Project water supply conditions were materially improved, and irrigation was suspended immediately and the canal head gates closed.

## Plan to Increase Water Supply

**A**LTHOUGH most of the irrigation projects of the Bureau of Reclamation enjoy an adequate water supply, there are a few projects which suffer from occasional or recurrent water shortages. The causes of these shortages and particularly any possible remedies that may be available are naturally of vital interest to every water user on any project subject to such difficulties.

Occasional shortages due to extreme variations from the annual mean run-off are to be anticipated in intensively developed irrigated districts. However extensive the period covered by stream flow records on any stream, there is always the likelihood that greater extremes both of flood and of drought may be experienced in the future than are included in the records and in fact the most efficient utilization of the water resources of a stream basin may involve such extensions of the irrigated area as to incur the certainty of limited shortages in case of the recurrence of years of run-off as low as the lowest years already recorded. Such shortages frequently in effect are blessings in disguise, encouraging efforts at improvement of water duty and averting the serious consequences which always, soon or late, accompany the unrestrained application of large quantities of irrigation water to the land.

The few instances of recurrent shortages on our projects may be due either to an original overestimate of the run-off available to meet project needs, to the loss of available storage due to silting, leakage or other impairment of reservoir capacity, or to higher peak demands than that for which the main canal or distribution system was designed. On these projects the situation is usually complicated by the fact that some land is of such poor character that it will not pay to be developed.

Such projects present two problems for solution:

- (a) An increase in the water supply for at least a part of the good land.
- (b) Exclusion of poor land now included in the irrigable area.

An inadequate water supply might be relieved by providing additional storage; by enlarging canals; by improving the lateral and sublateral systems to lessen seepage losses, improve delivery control, and lessen possibilities of interruption of service; by lining laterals to save seepage losses and prevent interruption of service; and by a reduction of the irrigable acreage by eliminating the lands that can not be farmed profitably.

Where the cost of these measures is not excessive, and the returns from the land under ditch are so uniformly attractive that this additional cost is not burdensome, it is comparatively a simple matter to remedy both situations. When, on the other hand, there is absolutely no more water to be had or when to provide the additional supply would involve burdensome or prohibitive expense, some other means of relief must be sought.

Suggested solutions for the two problems in the latter case are—

1. Permit the transfer of water from poor land to good land by any water users to the extent of 25 per cent of the area of his good land.
2. Permanently transfer the water from the area from which it is taken to the new area by a formal contract. For example, a landowner with 20 acres would be allowed to purchase and permanently transfer water for 5 acres of land located on any other part of the project to the 20-acre tract. The water user would then pay the regular charge per acre for 25 acres in order to obtain water for his land, in place of only 20 acres.
3. All land from which water is transferred would be permanently excluded from the irrigable area of the project.

### Farmers' Cooperative Business Associations

*Ten thousand eight hundred and three farmers' business organizations of all kinds, types, and sizes were listed with the Department of Agriculture at the close of 1925. This number lacks but 45 of being double the number listed in 1915 when the first nation-wide survey of cooperative associations was made.*

*The total number of active associations, including those which have reported to the Department of Agriculture and those which have not, is estimated at 12,000. These figures are for business associations, those selling farm products, buying farm supplies, operating creameries, cheese factories, canning plants, grain elevators, stockyards, warehouses, or rendering some one or more of the essential services connected with the conduct of the farmers' enterprises. The figures do not include farmers' cooperative banks, credit associations, nor insurance companies.*

Such a plan would accomplish the following results:

1. Give owners of land in cultivation an opportunity to secure immediate relief from water shortage.
2. Eliminate poor land.
3. Save the necessity for an immediate investment in new construction or betterment work.
4. Allow the water users who think they have a sufficient supply of water to proceed as they are without increasing their construction costs.

Under the present policy of requiring all lands to make payment, the poor land would either have to pay up or sell out. Thus the area than can not be farmed profitably would be forced on the market and the water from it would be made available for the better lands than can pay the construction charges. Also there would be no necessity for charging off any construction charge, and the lands getting the water would pay for it in the same manner as they would pay for an increased water supply from any other source.

### Salt River Project Water Supply Increased

The Salt River project, Arizona, has recently completed its additional pumping project and has added to the water supply a total of 480 second-feet, giving them an available pumped water supply of more than 300,000 acre-feet for irrigation. This will give the project an equal water supply with that of last season, even with a continuation of the same drought conditions as prevailed last year. This year the stored water supply is 175,000 acre-feet behind that of last year. However, the project carried over 110,000 acre-feet from last year, so that there is an actual shortage in the stored water supply of only 65,000 acre-feet. The additional pumped water supply will more than make up this difference.

April will see the completion of the Mormon Flat plant, which will add 25,000,000 kilowatt-hours to the power system in dry years. The Horse Mesa project is more than half completed and should be in operation by next February. These developments will insure the project's water supply against serious drought, with water assessments not to exceed this year's cost to the farmer, even though the drought continues for several years.

In general the project is better farmed than at any time in its history; and the farmers are assured of a minimum of 2.6 acre-feet delivered to each acre in the project, in addition to the normal flow for the older lands of approximately 150,000 acre-feet.

## Organization Activities and Project Visitors

SECRETARY Work and Doctor Mead left Washington on April 17 for the Southwest. They will visit the lower Rio Grande Valley for a personal study of conditions affecting the development of the Rio Grande, later visiting the Rio Grande and Yuma projects and making a trip down the Colorado River to the Boulder and Black Canyon dam sites. They expect to return to Washington May 3.

R. F. Walter, chief engineer, and E. B. Debler, engineer in the Denver office, were in Washington recently for a conference to fix definitely the conditions for the development of Spanish Springs.

William S. Arthur, former superintendent of the Williston project, has been granted leave without pay for six months from April 7 to October 6, 1926.

Max H. Knight, junior engineer in the designing section of the Denver office, resigned effective March 27.

Mrs. Clara G. Hood, née Clara G. Parse, clerk in the Denver office, resigned effective March 31, following her recent marriage.

Jacob R. Ummel, former chief clerk of the Denver office, has been appointed office manager of the Seattle office of the Bureau of Education and The Alaska Railroad. L. R. Smith has been designated acting chief clerk of the Denver office.

John F. Richardson, superintendent of the Newlands project, has resigned to accept a position in Mexico with the J. G. White Engineering Corporation. D. S. Stuver has been designated acting superintendent.

Mrs. Jennie T. Davis, auditor in the Washington office, retired from the bureau on April 29, after 44 years of continuous service with the Government, 36 of which were with the Interior Department. Mrs. Davis was entertained at luncheon by the other women of the Washington office and presented with a mahogany table.

The Lower Yellowstone project has been represented in Washington recently by a delegation consisting of H. A. Parker,

superintendent; O. M. Oppegaard, Savage, Mont.; Augustus Vaux, Sidney; A. H. Phillips, Fairview; and C. S. Milhiser, superintendent of the Sidney plant of the Holly Sugar Corporation.

Charles T. Pease died in Denver, Colo., on March 20, 1926, of pneumonia. Mr. Pease was born in Bridgton, Me., on May 3, 1858. He graduated from the State University of Maine and from the Denver University Law School. He has been connected with the Bureau of Reclamation since December 14, 1903, in various engineering capacities, including project management and investigation of proposed irrigation, flood control, and power developments in the West.

The delegation in Washington from the Shoshone project in connection with project adjustments consisted of L. H. Mitchell, superintendent; G. W. Atkins; and S. A. Nelson. While here, Mr. Nelson ordered a number of colored enlarged photographs of scenes on the project to hang in his bank.

Frank P. Trott, State water commissioner of Arizona, and H. S. McClusky, secretary to the Governor of Arizona, conferred on March 26 with the board of governors of the Yuma County Water Users' Association and Superintendent Preston regarding the leasing of a power site at Laguna Dam and the development of power.

The Attorney General has assigned W. C. Matthews, a special assistant, to have direct charge of the Stony Creek water right adjudication litigation, Orland project, for the Department of Justice under the general supervision of Ethelbert Ward, special assistant. Several days were spent by these officials in San Francisco in consultation with Oliver P. Morton, attorney for the Orland Unit Water Users' Association, regarding the immediate work to be undertaken in the case.

Assistant Engineer E. R. Romberg, Grand Valley project, has made application for a furlough for one year to accept a position as city engineer for Grand Junction. Mr. Romberg has previously worked for the city and has been offered a very satisfactory position in charge of a large paving and sewer construction program.

W. G. Steward, who has been on the Boise project for about 11 years in charge of hydrographic work, has resigned to work for the Twin Falls South Side Canal Co.

L. N. McClellan and C. M. Day, engineers in the Denver office, visited the Boise project recently to make the final inspection of the Black Canyon Dam power plant and to test the different units.

E. B. Debler, engineer in the Denver office, spent a short time on the Boise project gathering data for a special report on the project extensions.

Barry Dibble, former superintendent of the Minidoka project and now consulting engineer of Redlands, Calif., was on the project during March preparing a report on power credits for the Minidoka irrigation district.

B. H. Critchfield, agricultural economist, and G. L. Sulerud, assistant agricultural economist, visited the Burley office of the Minidoka project recently in connection with the economic survey of Idaho agriculture now in progress.

Hiram Shipley has been employed as gatekeeper at Orman; Verne Bracewell as foreman at Vale; and J. L. Barker as ditch-cleaner operator at Orman, Belle Fourche project.

District Counsel E. E. Roddis and W. J. Burke spent a few days on the Belle Fourche project to consider pending legal work. Conference was also had with the secretary of the irrigation district relative to the legal difficulties encountered under the proposed supplemental contract.

Andrew Weiss, assistant director of Reclamation Economics, and William M. Green, engineer, visited the Strawberry Valley project during March to make an inspection of lands in the vicinity of Utah Lake.

Arthur Ruettgers, assistant engineer on the Riverton project, has been transferred to the Kittitas division of the Yakima project.



# NEW RECLAMATION ERA

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NO. 6



SUGAR BEETS VALUED AT \$4,413,000 WERE GROWN ON THE PROJECTS LAST YEAR



# GOVERNMENT OF THE UNITED STATES

## EXECUTIVE BRANCH THE PRESIDENT

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96 SENATORS

**HOUSE OF REPRESENTATIVES**  
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PERSONNEL CLASSIFICATION BOARD  
U. S. EMPLOYEES' COMPENSATION  
FEDERAL BOARD FOR VOCATIONAL EDUCATION  
NATIONAL FOREST RESERVATION COMMISSION  
PUBLIC BUILDINGS COMMISSION

#### CHIEF COORDINATOR

FEDERAL  
COORDINATING  
AGENCIES  
PURCHASING  
LIQUIDATION  
MOTOR TRANSPORT  
TRAFFIC  
SPECIFICATIONS  
CONTRACT  
REAL ESTATE  
PRINTING  
SIMPLIFIED PROCEDURE  
PATENTS  
PAN AMERICAN UNION

AMERICAN NATIONAL RED CROSS

#### WAR BOARDS, ETC.

UNITED STATES VETERANS' BUREAU  
UNITED STATES SHIPPING BOARD  
U. S. EMERGENCY FLEET CORPORATION  
NAT'L ADVISORY COM'TEE AERONAUTICS  
ALIEN PROPERTY CUSTODIAN  
WAR FINANCE CORPORATION  
U. S. RAILROAD LABOR BOARD  
U. S. RAILROAD ADMINISTRATION  
U. S. COUNCIL OF NATIONAL DEFENSE  
WORLD WAR FOREIGN DEBT COMMISSION  
AMERICAN BATTLE MONUMENTS COMMISSION  
NATIONAL SCREW THREAD COMMISSION  
AMERICAN AND BRITISH CLAIMS ARBITRATION  
MIXED CLAIMS COMMISSION, U. S. & GERMANY  
FEDERAL NARCOTICS CONTROL BOARD  
JOINT ARMY AND NAVY BOARD

#### MISCELLANEOUS

INTERNATIONAL JOINT COMMISSION  
INTERNATIONAL BOUNDARY COMMISSIONS  
U. S. SEC. INTER-AMERICAN HIGH COMMISSION  
UNITED STATES GEOGRAPHIC BOARD  
BOARD OF SURVEYS AND MAPS  
OFFICE OF PUBLIC BUILDINGS AND PUBLIC PARKS  
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COMMISSION ON NAVY YARDS AND STATIONS  
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NATIONAL HOMES - VOLUNTEER SOLDIERS  
U. S. SOLDIERS' HOME - REGULAR ARMY  
PAN AMERICAN SANITARY BUREAU  
DISTRICT OF COLUMBIA GOVERNMENT

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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No. 6

## *Interesting High Lights on the Reclamation Projects*

**A** NUMBER of potato growers on the Yakima project were reported to have been offered \$100 a ton during April. H. C. Davis, of Granger, after selling part of his crop, was holding the balance which he valued at \$30,000. The excellent prices received by the water users on this and other projects afford a partial explanation at least of the increase in collections of reclamation charges. The goal should be 100 per cent on every project.

**D**ESIGNS and specifications for the construction of Gibson dam, Sun River project have been completed and forwarded to the Washington office for publication.

**D**URING April 420 carloads of agricultural products were shipped from the Yuma project, valued at \$189,650. Since the beginning of the year the value of such products shipped has amounted to \$1,283,850. Collections for the month on reclamation charges amounted to \$14,297.01.

**T**HE Arizona State Highway Department let a contract recently for the construction of the Telegraph Pass road between Yuma and Wellton, which will shorten the distance about 6 miles. The estimated cost of the work is about \$250,000.

**S**HEEP men who wish to place lambs for feeding on Grand Valley project farms have submitted a plan under which the project farmers would be paid a certain guaranteed price per pound of gain and the owners would share equally in any loss by disease or accident which might occur during the feeding period. This movement is considered well worth encouragement, providing a valuable asset to the water users both from the standpoint of the money received and the increased fertility of their farms.

**O**F the 1,028 delinquent accounts on March 1 on the Uncompahgre project, 861 had been cleared on April 30 for the delivery of water for the irrigation season. It is estimated that between 90 and 95 per cent of the lands on the project which received water during the 1925 season are cleared for water for the present season.

**T**HE market for potatoes on the Uncompahgre project held up well during the month, ranging from \$3 to \$4 per hundredweight, as a result of which only about 12 cars remained for future shipment at the end of the month.

**T**OTAL collection of reclamation charges by the Burley Irrigation District, Minidoka project, at the end of April amounted to \$55,588.40. Payment had been made on more than 96 per cent of assessable land in the district. On the Gravity division, the Minidoka irrigation district withheld water from all individual water users more than a year in arrears, and at the end of the month all but about 200 water users had paid. As there were 141 idle farms out of 1,545 on this division in 1925 it is believed that comparatively few properties upon which water is desired are now delinquent.

**A**T American Falls Dam about 25,900 cubic yards of concrete were placed in the river section, three concrete mixers being used on the work. Excavation for the left abutment section and stripping for the left embankment were in progress.

**S**EEDING of certified potato stock was in progress on the Milk River project and contracts were being made for the sale of certified seed next fall at \$2 per hundredweight f. o. b. cars at project points.

**P**LANs are being developed on the Lower Yellowstone project for obtaining listings and options on at least 8,000 acres of project land, the options to run to the United States and continue until December 31, 1928. Early indications are that a sufficient number of satisfactory listings will be obtained.

**T**HE rabbit industry is growing steadily on the Newlands project, farmers finding that uniform demand and good prices make this a profitable side line. One water user derives his whole income from 3,000 rabbits, killing on an average 200 a week, averaging more than 3 pounds each, and selling around 27 cents a pound.

**A**T McKay Dam, Umatilla project, concrete work on the spillway gate structure was completed during the month. Work was continued on placing the concrete paving on the upstream face of the dam. During the month 2,516 cubic yards of concrete paving, averaging 10½ inches in thickness, were placed, at a unit cost of \$18.80.

**A** COW-TESTING circle is being organized in the vicinity of Palmyra, Strawberry Valley project, composed of 8 or 10 dairymen handling about 100 cows. The outlook appears promising for a further spread of this kind of cooperative movement. Poultry and poultry products are gaining in importance on the project, about 65 per cent of these products handled by the Utah State Poultry Association operating through locals distributed throughout the farming districts.

**T**HE Okanogan project reports that a large crop of apples is in prospect if sufficient water is available. At the end of the month the apple orchards had all come into blossom and been given calyx spray.

## Time Has Come To Build Colorado River Dam, Says Secretary Work

*The Colorado River Dam, with its unrivaled power possibilities, promising protection against floods, domestic water for great and growing cities, and an all-American canal for Americans, most constructive legislation before Congress*



Black Canyon dam site on the Colorado River

UPON his return from a trip to the Pacific coast investigating the proposed lower Colorado River development, Secretary Work said in connection with it:

"The time has come to build the Colorado River Dam at Black Canyon. Our engineers have spent three full years, working every day, making borings to determine the security of its construction when completed. These borings have been pushed to a depth of 400 feet; the cores show solid granite, without fault or flaw. There is now no question about the foundations for this gigantic structure.

"The cleft in the mountains through which the Colorado River flows is 300 feet wide at the stream level and 700 feet wide, 600 feet above the river. The mountains extend for miles each way from this slit, at the same height, so that the wings of this dam are already constructed with masonry more stable than man could build. The saving in the building cost of these wings of this tremendous project are past estimate in dollars.

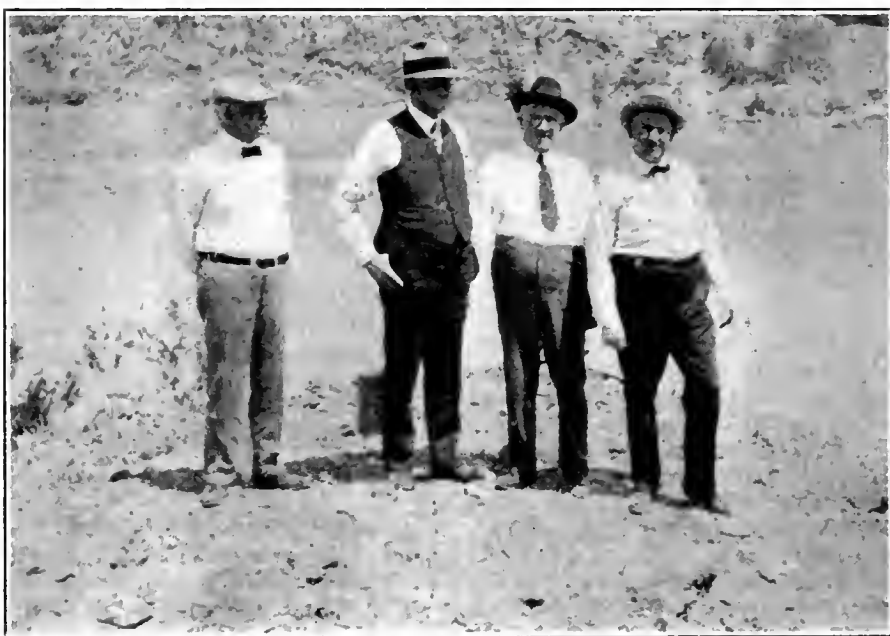
"Nature placed this canyon about where it ought to be for the proposed purposes. At Parker, Ariz., a short distance below, the application of water for irrigation will begin and this need continues to extend on both the Arizona and California sides all the way down to

the international boundary, some 250 miles.

"When the pending bill is passed by Congress, the first step toward construction will necessarily be the diversion of the Colorado River out of its natural

channel, by tunnels to be run through the mountains around the site of the dam. Nature has again contributed to this first step by providing a safe foundation for the cofferdam, which must be placed in the stream above, to divert the river through these improvised channels. It is estimated that more than one year will be required to construct the three necessary tunnels to divert the water from the site of the new structure. This will be expensive, but the money will not be lost, as the power plants will be constructed at the lower ends of these tunnels, which will have served their purpose when the works are completed, but which would otherwise have to be built independently to operate the power plants. I believe the necessity for this construction is imminent. There is untold wealth under the surface of the mountains and plains of these adjacent States, of which the precious metals constitute the smaller part. Man power must be supplemented by hydroelectric power to extract these hidden resources in addition to an estimated agricultural production of one hundred million dollars.

"This entire project has been thought out on the theory that, unlike money appropriated for rivers and harbors, it will be returned in time to the Government and the amortized plant will then belong to the Government as property



At the Black Canyon dam site, Colorado River. Left to right: E. E. Colvin, vice president Southern Pacific Railroad; Secretary Work; Commissioner Mead; Governor Scrugham, of Nevada

to be disposed of as conditions at that time may suggest.

"The Bureau of Reclamation has, over a period of many years, prepared engineering plans, which we believe well conceived and safely founded, to use in this construction. The Bureau of Reclamation as now organized is equipped to prosecute this development. Commissioner Mead has 25 years' acquaintance with the river and the topography of its basin and the necessary technical knowledge, experience, and judgment—a background that no other man has for this work.

"There is more money available in this country than there are men to use it profitably. Of course, the first step toward construction should be the selection of a board of the most competent engineers to be found in the country, none of them now in the Government service; this board to pass on and approve every step before it is taken. The selection of these men will be of more importance than any other single administrative feature of this proposed project.

"The Bureau of Reclamation has in its files data covering our river relations with Mexico and of the joint uses now being made of its waters. It has soil studies of the lands to be irrigated by this project. It is familiar with and approves the provisions of the Colorado River compact, which is a vital feature of this entire plan. It has in hand the engineering studies, maps, and conclusions bearing on the different interests to be served, up to the just completed studies on the conveying of water to Los Angeles for domestic use.

"The many interests, each vitally concerned in this project, must be studied separately and alone, then in their relation to the whole.

"The two large cities immediately interested in this river water for domestic use are Denver and Los Angeles, both outside of the Colorado River Basin; the former at the river's sources, the latter near its mouth, 1,000 miles distant from each other.

"The only irreplaceable known mineral is water. We now know how much may be expected to fall from the clouds in the form of rain and snow. We know that the annual consumption of water now equals the available supply. Nothing possible remains for man to do but to store and distribute this one essential of life to those first needing it, and arrange for storage of more as our increasing population may demand, when gathered in its last channels, to regulate its flow by man's ingenuity, so that its volume may no longer be a menace but be held in reserve to offset the annual drought of arid regions.

"The necessity for foresight in the storage of water for present and subse-

## July 17, 1926—Dr. Elwood Mead Day

*On the Belle Fourche project, South Dakota*

THE annual farm picnic at the United States Experimental Farm, near Newell, S. Dak., on the Belle Fourche project, is to be known this year as "Dr. Elwood Mead Day," in honor of the commissioner of the Bureau of Reclamation. In accepting the invitation to be present, extended by the officers of the irrigation district and the Newell Community Club, Doctor Mead wrote as follows:

### *Pacific Slope States Produced Bumper Crops*

*The 11 States of the Pacific slope harvested in 1925 crops that exceeded in value by \$168,531,000 the agricultural output of 1924, according to the Mercantile Trust Review of the Pacific.*

*The estimated value of the crops of the region for that year was in excess of \$1,250,000,000, and was greater than in any other year since 1900. The Pacific slope supplied more than 13 per cent of the country's income from its farms. The region showed a substantial increase in the farm value of its crops in the face of a decline of \$447,116,000 in the value of the nation's harvest in 1925 as compared with 1924. Had it not been for the increase in the Pacific and Mountain States, crop values would have shown a decline for the country as a whole of \$615,647,000.*

quent use each year becomes more apparent. It should be safeguarded and used in the upper reaches of streams first if we are to secure the largest future use and provide for the necessities of our own people along streams. Water when spread upon the surface in the upper valleys will find its own way back to the stream, to be used again and again.

"The proposed Colorado River compact to guard the rights between States, between the upper and lower river basins; the Colorado River Dam, with its unrivalled power possibilities, promising protection against floods, domestic water for great and growing cities; and an all-American canal for Americans, to avoid future international disagreements between the administrations of now friendly Republics, comprise, I believe, the most constructive legislation now before Congress."

"Your cordial invitation to attend the annual picnic on July 17 was acknowledged a few days ago. Since then it has had more consideration and I have decided to attend, regardless of other demands on my time and the distance that is involved.

"This conclusion has been reached because the people on the Belle Fourche project are showing such fine spirit and are moving forward in such a constructive fashion to make this project all that it ought to be, that it is up to the members of the Reclamation Bureau to do everything in our power to give this project its proper place in the sun and to make it known to qualified farm buyers and home seekers.

"This picnic can and should be made an instrument for calling the attention of the country to what is being accomplished in the upbuilding of this project. I will bring with me a photographer equipped to take motion pictures and photographs of prosperous and unoccupied farms. These will be used in the preparation of lantern slides and to illustrate magazine articles. I will endeavor to have a representative of one or more of the press syndicates come at that time and go over the project.

"Mr. Kreutzer will visit you at an early date and help in the preparation of plans. What we want is to have the project looking as well as it ever did, and to have by that time a list of farms that will furnish attractive opportunities to home seekers. I hope it can be arranged for the governor of the State and the congressional delegation to be present. Mr. Williamson should be there by all means. We will bring this matter to the attention of the railroads and the sugar-beet people and try to have representative officers there at that time, so we can have a conference over measures for the development of the project and for letting the world know what it has to offer.

"The spirit you are manifesting and the measures now under way give me confidence that the Belle Fourche project will, in the near future, be ranked among our successful irrigation undertakings."

Potatoes are grown in every State in the Union and move in carload quantities every day in the year. Approximately 33 per cent of the 418,000,000 bushels produced annually are shipped by rail.

## Women on the Projects and Their Relation to Better Agriculture

*The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life*

*By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era*

**G**ATHERING data for this section has indeed become a delight. I had no idea there were so many sources for its procurement and the helpful and cooperative spirit I have found everywhere has not only lightened my task but has been very gratifying. Everyone wants to contribute his or her bit to any effort that has as its goal the betterment of farm conditions from all standpoints. Interest is widespread and the technical man and woman as well as the laymen are continually studying ways and means to accomplish this end.

More schools and colleges, are, by popular demand, establishing courses designed to make the farm home attractive and the haven of healthy, contented, and happy families.

The engineer, the agriculturalist, the architect, and the home economist do not vie for individual honors, but on the contrary have banded together for an organized effort to work out the knotty problems presented.

### "Last But Not Least"

#### *Beautifying the Project Home Surroundings*

A beautiful home may be materially enhanced in attractiveness by improving its surroundings, or to state it differently, the beauty of a home is brought out by attractive surroundings.

Trees, well placed, not only give effect but are very practical, giving the cool, refreshing shade so desirable during the hot months. On account of the length of time it takes to grow a good-sized shade tree this should be your first step to improve the grounds.

Considerable thought should be given to their location. They might be advantageously placed near each corner of the house but not so as to obstruct the view. Other trees may be placed around the grounds, keeping in mind the retention of your view from the front of the house or from a porch.

Your next step is well-arranged shrubbery. If you have an appreciation of the beautiful your imagination, allowed to roam, will dictate arrangement.

Flowering plants selected with a view to having blooms throughout the season are best.

Add a window box or two, or a trellis. They are inexpensive and easily made. You will be rewarded by the effect.



One of the better homes on the Yakima project, Washington

### *Women in Relation to the Project Home*

*By Miss Helen C. Willsey, Bureau of Reclamation, Boise, Idaho*

**T**HERE are rather a diversity of homes on the Boise project. Some are homey, well cared for and prosperous looking; others are not. This phase of the matter depends to a great extent on the project wife. Some women are natural-born homemakers and their energy is unbounded in making the house and grounds livable and beautiful. Also some go to unlimited effort in their culinary arts and keep the health standard up by preparing nourishing and well-balanced meals. In addition some of them care completely for a flock of chickens or a vegetable garden from which a supply of winter vegetables can be stored away. This helps materially in the success of a farm and has more than once tided the farmer over a rough place.

One woman on the Boise project has made a successful venture with a half-acre strawberry patch. She cared for this in addition to her housework and during the strawberry season sold her berries each day, right at her door, to a truckman who

peddled them to the town districts. At the close of one season, deducting harvesting expense, she realized \$250 for her work and had a generous home supply canned.

She related that the work in her strawberry patch benefited her health as it kept her almost constantly in the sunshine, besides breaking the monotony of housework.

Another wife has realized a sideline profit on squabs which she dresses for hotel use.

Another project woman saw the demand for the good old home churned buttermilk, which doctors are recommending so much now for diets. Because the farm supply of milk is sold directly to creameries and condenseries, home buttermilk is almost passé. This woman gathered together the necessary buttermaking equipment and installed it in an unused portion of the milk house. She not only sold the butter but also the buttermilk and received for the latter as much as she would for whole milk. This same





A little bit of sunshine at Arrowrock Dam, Boise project, Idaho

project wife, when her milk house was being constructed, insisted that the workman install tiny long landscape windows and window boxes which she filled with flowering plants that made gay splashes of color against the walls. The milk house suggested more of a refuge of pleasure than a mechanical workhouse.

More and more farm women realize that touches of color and beauty smooth down the rough edges of farm work, making it a pleasure instead of a drudgery.

The primary object of a community canning kitchen is to secure the best returns for the time, effort, and capital invested. Hence the use of modern labor-saving equipment will prove economical in the end.

### Arthur Brisbane Lauds Frost-free Yuma Mesa

*Writing from Yuma, Arthur Brisbane pictures the Yuma Mesa as follows in a recent article in the Washington (D. C.) Herald:*

*"Imagine, you that have never seen this enchanted Yuma Mesa, a table-land where orange growers have no smudge pots, because they have never had a frost, where they never spray or fumigate, because they have no scale or other insect pest to worry them, and where the State government watches every plant, fruit, or seed that enters its territory, to keep out danger."*

## Sun River Project Boys Take Smith-Hughes Work

A recent clipping from the Great Falls Tribune, forwarded by Superintendent Sanford of the Sun River project, Montana, states that more than 30 boys of the Simms high school and junior high school are engaged in Smith-Hughes agricultural project work for the coming year. The agricultural principles taught in school are put into practice by carrying on these projects. The boys carefully plan their work, do the tasks themselves, keep records, and make a final summary.

One of the outstanding projects of the past year was that conducted by Bruce Garlinghouse, a son of one of the project water users living near Simms. Bruce made \$800 from three acres of potatoes. When asked how he succeeded so well he said, "I worked hard and put the ideas that I got from the schoolroom into practice."

Total receipts from project work in the past year at Simms amounted to \$3,747.92 and the net profits were \$2,443.63. The school plans to double these figures in the coming year.

Superintendent Sanford adds that whenever there are competitive meets, it is always noted that the boys from Simms make an excellent showing, particularly in judging livestock and agricultural products.

## Milk River Project Sugar Beets in 1925

In the table on page 43 of the March issue of the New Reclamation Era, showing acreage, yield, and value of sugar beets grown on the projects in 1925, the figures for the Milk River project covered only the Malta and Glasgow divisions. David Scott, agricultural superintendent of the Utah-Idaho Sugar Co., has furnished the following figures for the Chinook division:

Total acreage planted in Blaine County.....	2,483
Total acreage harvested.....	2,000
Total acreage not harvested.....	483
Total tons harvested on 2,000 acres.....	16,807

Using these figures the first three items in the table for the project would be increased to the following:

Acreage.....	3,009
Yield (tons).....	24,579
Yield per acre (tons).....	8.2

The total value would amount to about \$151,360 and the total value per acre would remain at about \$50.50.

## Legislation Relating to the Federal Irrigation Projects

*The appropriation act for the Bureau of Reclamation and other enactments relating to the irrigation of arid lands in the West, including an appropriation for an investigation of the Columbia River and providing for fair grounds on Shoshone project, Wyoming*

### Appropriations for 1927

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of the Interior for the fiscal year ending June 30, 1927, namely:*

\* \* \* \* \*

#### BUREAU OF RECLAMATION

The following sums are appropriated out of the special fund in the Treasury of the United States created by the act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

For all expenditures authorized by the act of June 17, 1902 (Thirty-second Statutes, p. 388), and acts amendatory thereof or supplementary thereto, known as the reclamation law, and all other acts under which expenditures from said fund are authorized, including personal services in the District of Columbia and elsewhere; examination of estimates for appropriations in the field; refunds of overcollections hereafter received on account of water-right charges, rentals, and deposits for other purposes; printing and binding, not exceeding \$30,000; purchase of rubber boots for official use by employees; purchase, maintenance, and operation of horse-drawn and motor-propelled passenger-carrying vehicles; payment of damages caused to the owners of lands or other private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, or maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior, or such officers as he may designate; and payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior: *Provided*, That no part of said appropriations may be used for maintenance of headquarters for the Bureau of Reclamation outside the District of Columbia except for the office of the chief engineer: *Provided further*, That the Secretary of the Interior is hereby authorized, in his discretion, until June 30, 1927, to extend the time for payment of operation and maintenance of water-rental charges due and unpaid for such period as in his judgment may be necessary, not exceeding five years. The charges so extended shall bear interest, payable annually, at the rate of 6 per centum per annum until paid. The Secretary of the Interior is also authorized, in his discretion, until June 30, 1927, to contract with any irrigation district or water-users' association for the payment of the construction charges then remaining unpaid within such term of years, as the Secretary may find to be necessary. The construction charges due and unpaid when such con-

tract is executed shall bear interest payable annually at the rate of 6 per centum per annum until paid.

No part of the sums provided for in this act for the Sun River, Owyhee, Vale, and Baker projects shall be expended for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or irrigation districts organized under State law providing for payment by the district or districts of the cost of constructing, operating, and maintaining the works during the time they are in control of the United States, such cost of constructing to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than 40 years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Upon such confirmation of such contract as to any one of such projects, the construction thereof shall proceed in accordance with any appropriations therefor provided for in this act. Prior to or in connection with the settlement and development of each of these projects, the Secretary of the Interior is authorized in his discretion to enter into agreement with the proper authorities of the State or States wherein said projects or divisions are located whereby such State or States shall cooperate with the United States in promoting the settlement of the projects or divisions after completion and in the securing and selecting of settlers. Such contract or contracts with irrigation districts hereinafter referred to shall further provide that all irrigable land held in private ownership by any one owner in excess of 160 irrigable acres shall be appraised in a manner to be prescribed by the Secretary of the Interior and the sale prices thereof fixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from any project or division if the owners thereof shall refuse to execute valid recordable contracts for the sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior; and that until one-half the construction charges against said lands shall have been fully paid no sale of any such lands shall carry the right to receive water unless and until the purchase price involved in such sale is approved by the Secretary of the Interior and that upon proof of fraudulent representation as to the true consideration involved in such sales the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sales: *Provided further*, That the operation and maintenance charges on account of lands in said projects and divisions shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water

is actually available, and the operation and maintenance charges payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment;

Salt River project, Arizona: For examination of project and project accounts, \$3,000;

Yuma project, Arizona-California: For operation and maintenance, continuation of construction, and incidental operations, \$400,000: *Provided*, That the unexpended balance of \$72,000 of the appropriation of \$200,000 for the Yuma auxiliary project, contained in the second deficiency act, fiscal year 1925, Forty-third Statutes at Large, page 1330, is hereby reappropriated and made available for the same purposes for the fiscal year 1927:

Orland project, California: For operation and maintenance, continuation of construction, and incidental operations, \$635,000;

Grand Valley project, Colorado, including Orchard Mesa division: For operation and maintenance, continuation of construction, and incidental operations, \$80,000: *Provided*, That not to exceed \$20,000 of the unexpended balance of the appropriation of \$278,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1166), shall remain available for the fiscal year 1927;

Uncompahgre project, Colorado: For operation and maintenance, continuation of construction, and incidental operations, \$145,000: *Provided*, That the Secretary of the Interior is authorized to use so much of this amount as may be necessary in investigating the feasibility of discontinuing the operation of any portion of this project and removing the water users now thereon to other lands elsewhere on the project and shall report hereon to Congress as early as may be practicable;

Boise project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, \$394,000: *Provided*, That the expenditure for drainage shall not exceed the amount paid by the water users pursuant to the provisions of the Boise public notice dated February 15, 1921, except for drainage in irrigation districts formed under State laws and upon the execution of agreements for the repayment to the United States of the costs thereof: *Provided further*, That the unexpended balance of the appropriation for the fiscal year 1926 made available by the act approved March 4, 1925, shall remain available for the fiscal year 1927 for development of storage facilities for the Black Canyon unit;

King Hill project, Idaho: Any moneys which may be advanced by the King Hill irrigation district for construction and operation and maintenance shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which contributed in like manner as if said sums had been specifically appropriated for said purposes;

Minidoka project, Idaho: For operation and maintenance, continuation of

construction, and incidental operations, \$2,005,000: *Provided*: That the accumulated net profits as determined by the Secretary of the Interior, arising under the project, derived from the operation of the project power plants, leasing of Government grazing and farm lands, the sale and use of town sites, and from all other sources, shall be applied by the Secretary of the Interior, so far as may be necessary, in payment of any water-right charges due the United States by any individual water user or irrigation district to whose benefit personally or in the aggregate such accumulated profits should equitably accrue in the judgment of the Secretary of the Interior, whose decision shall be conclusive. Any surplus of such accumulated net profits and future profits from such sources shall be applied as provided by subsection I, section 4, act of December 5, 1924 (Forty-third Statutes, p. 701);

Huntley project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$36,000: *Provided*, That not to exceed \$60,000 of the unexpended balance of the appropriation of \$118,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1166), shall remain available for the fiscal year 1927;

Milk River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, \$72,000, and no part of this amount shall be available for maintenance and operation of the Glasgow division after December 31, 1926, unless a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment of construction and operation and maintenance charges for such district or districts: *Provided*, That no part of this amount shall be available for maintenance and operation of the Malta division after December 31, 1926, unless a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment of construction and operation and maintenance charges by such district or districts: *Provided further*, That any moneys which may be advanced for construction and operation and maintenance of the said Malta division after December 31, 1926, or of the Glasgow division hereafter shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which contributed in like manner as if said funds had been specifically appropriated for said purposes;

Sun River project, Montana: For operation and maintenance, continuation of construction and incidental operations, \$59,000: *Provided*, That the unexpended balance of the appropriation of \$611,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided*, That the restrictions carried elsewhere in this act upon the use of appropriations for construction purposes upon the Sun River and certain other projects shall not be deemed to apply to the construction of the Beaver Creek Reservoir;

Lower Yellowstone project, Montana-North Dakota: For operation and maintenance, continuation of construction, and

incidental operations, \$72,000: *Provided*, That not to exceed \$65,000 of the unexpended balance of the appropriation of \$180,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided further*, That no part of this amount shall be available for maintenance and operation after December 31, 1926, unless a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment of construction and operation and maintenance charges by such district or districts;

North Platte project, Nebraska-Wyoming: For operation and maintenance, continuation of construction, and incidental operations, \$1,500,000: *Provided*, That no part of this amount shall be available for maintenance and operation of any division of the project after December 31, 1926, unless a contract or contracts shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment of construction and operation and maintenance charges against lands of that division by such district or districts.

Newlands project, Nevada: For operation and maintenance, continuation of construction, and incidental operations, \$135,000: *Provided*, That not to exceed \$17,000 of the unexpended balance of the appropriation of \$167,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided further*, That the appropriation of \$245,000 made available by the act of June 5, 1924 (Forty-third Statutes, p. 415), and reappropriated for the fiscal year 1926 by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927 for use for drainage purposes, but only after execution by the Truckee-Carson irrigation district of an appropriate reimbursement contract satisfactory in form to the Secretary of the Interior and confirmation of such contract by decree of a court of competent jurisdiction and final decision on all appeals from such decree;

Newlands project, Spanish Springs division, Nevada: For continued investigations, commencement or continuation of construction, and incidental operations, the unexpended balance of the appropriation of \$500,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided*, That no water shall be delivered to irrigators on this division outside of the limits of the Truckee-Carson irrigation district until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment by the district or districts of the cost of constructing, operating, and maintaining the works during the time they are in the control of the United States, such cost of constructing to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than 40 years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of com-

petent jurisdiction. Prior to or in connection with the settlement and development of each of these projects, the Secretary of the Interior is authorized in his discretion to enter into agreement with the proper authorities of the State whereby such State shall cooperate with the United States in promoting the settlement of the projects or divisions after completion and in the securing and selecting of settlers. Such contract or contracts with irrigation districts hereinbefore referred to shall further provide that all irrigable land held in private ownership by any one owner in excess of 160 irrigable acres shall be appraised in a manner to be prescribed by the Secretary of the Interior and the sale prices thereof affixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from the division if the owners thereof shall refuse to execute valid recordable contracts for sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior, and that until one-half of the construction charges against said lands shall have been fully paid no sale of any such lands shall carry the right to receive water unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and that upon proof of fraudulent representation as to the true consideration involved in such sales the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sales: *Provided further*, That the operation and maintenance charges on account of lands in said division shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available, and the operation and maintenance charges payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment;

Carlsbad project, New Mexico: For operation, maintenance, continuation of construction, and incidental operations, \$50,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, continuation of construction, and incidental operations, \$507,000;

Owyhee project, Oregon: For continued investigations, commencement or continuation of construction, operation and maintenance, and incidental operations, the unexpended balance of the appropriation of \$315,000, made available by the act of December 5, 1924 (Forty-third Statutes, p. 685), and reappropriated for the fiscal year 1926 by the act of March 3, 1925 (Forty-third Statutes, p. 1168), shall remain available for the fiscal year 1927;

Umatilla project, Oregon: For operation and maintenance, continuation of construction, and incidental operations, \$407,000;

Vale project, Oregon: For continued investigations, commencement or continuation of construction, and incidental operations, the unexpended balance of the appropriation of \$500,000 for the fiscal year 1926, made available by the

(Continued on page 100)



# Appropriations for Reclamation During the Coming Fiscal Year

*Funds made available by Congress for old and new projects should make 1927 one of the banner construction years in the history of reclamation work in the Western States—Investigations in the South provided for*

(Continued from page 90)

act of March 3, 1925 (Forty-third Statutes, p. 1168), shall remain available for the fiscal year 1927: *Provided*, That not more than \$200,000 of the amount herein appropriated shall be available for purchases of a proportionate interest in the existing storage reservoir of the Warm Springs project, said interest to be conveyed to the United States free of all prior liens and encumbrances of every kind whatever: *Provided further*, That the contract for the purchase of said interest in said reservoir shall also provide for construction of the necessary drainage works by the said Warm Springs and Vale projects and the proportion of cost of said works to be borne by each;

Baker project, Oregon: For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1926 is reappropriated and made available for the fiscal year 1927;

Klamath project, Oregon-California: For operation and maintenance, continuation of construction, and incidental operations, \$140,000: *Provided*, That the unexpended balance of the appropriation made available by the act of March 3, 1925 (Forty-third Statutes, p. 1169), shall remain available for the fiscal year 1927;

Belle Fourche project, South Dakota: For operation and maintenance, continuation of construction, and incidental operations, \$40,000;

Strawberry Valley project, Utah: For operation and maintenance, continuation of construction, and incidental operations, \$39,000;

Salt Lake Basin project, Utah, first division: For continued investigations, construction of Echo Reservoir, Utah Lake control, and Weber-Provo Canal, operation and maintenance, and incidental operations, the unexpended balance of any appropriation available for these purposes for the fiscal year 1926 shall be available during the fiscal year 1927: *Provided*, That no part of this appropriation shall be used for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law, or water users' association or associations, providing for payment by the district or districts, or water users' association or associations: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available for such lands, and the operation and maintenance charges, if any, payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment;

Okanogan project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$65,000;

Yakima project, Washington: For operation and maintenance, continuation of construction, and incidental operations, \$294,000;

Yakima project (Kittitas division), Washington: For continued investigations, commencement or continuation of construction, operation and maintenance

## Appropriations for reclamation 1926 and 1927

Project	Interior Department appropriation act fiscal year 1927, approved May 10, 1926	Prior appropriations continued available, fiscal year 1927, by act of May 10, 1926 <sup>1</sup>	First deficiency act approved Mar. 3, 1926
Salt River.....	\$3,000		
Yuma.....	400,000		
Yuma auxiliary.....		\$72,000	
Orland.....	635,000		
Grand Valley.....	80,000	20,000	
Uncompahgre.....	145,000		
Boise <sup>2</sup> .....	394,000	111,000	
King Hill.....	(0)		
Minidoka <sup>3</sup> .....	2,005,000		
Huntley.....	36,000	60,000	
Milk River <sup>4</sup> .....	72,000		
Sun River.....	59,000	611,000	
Lower Yellowstone <sup>5</sup> .....	72,000	65,000	
North Platte <sup>6</sup> .....	1,500,000		\$300,000
Newlands.....	135,000	262,000	
Newlands-Spanish Springs.....		500,000	
Carlsbad.....	50,000		
Rio Grande.....	507,000		
Owyhee.....		315,000	
Umatilla.....	407,000		
Vale.....		500,000	
Baker.....		500,000	
Klamath.....	140,000	561,000	
Belle Fourche.....	40,000		
Strawberry Valley.....	39,000		
Salt Lake Basin.....		1,275,000	
Okanogan.....	65,000		
Yakima.....	294,000		
Yakima-Kittitas.....		750,000	2,000,000
Riverton.....	50,000		
Shoshone <sup>7</sup> .....	128,000	150,000	
Secondary.....	75,000		
Economic investigations.....	100,000		
Total from reclamation fund.....	7,431,000	5,752,000	2,300,000
Miscellaneous items:			
North Platte—Judgment, The Bothwell Co.....			22,134
Colorado River front work and levee system <sup>8</sup> .....	35,000		
Investigations of arid, semiarid, swamp, and cutover timberlands.....	15,000		
Total.....	7,481,000	5,752,000	2,322,134

<sup>1</sup> Limited to unexpended balances of amounts shown.

<sup>2</sup> Additional appropriation of \$50,000 proposed in second deficiency bill, fiscal year 1926.

<sup>3</sup> Authorizes expenditure of any funds advanced by the King Hill irrigation district.

<sup>4</sup> Does not include funds contributed by contractors participating in construction of American Falls Reservoir.

<sup>5</sup> Not available for operation and maintenance after Dec. 31, 1926, unless appropriate contracts are entered into with irrigation districts.

<sup>6</sup> Not available for operation and maintenance of Frannie division after Dec. 31, 1926. Authorizes expenditure of funds advanced for construction and operation and maintenance of this division after that date.

<sup>7</sup> To be transferred from General Treasury to reclamation fund.

and incidental operations, the unexpended balance of the appropriation of \$375,000, made available by the act of December 5, 1924 (Forty-third Statutes, p. 685), and reappropriated for the fiscal year 1926, by the act of March 3, 1925 (Forty-third Statutes, p. 1170), and the unexpended balance of the \$375,000 additional made available by the act of March 3, 1925 (Forty-third Statutes, p. 1170), shall remain available during the fiscal year 1927;

Riverton project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, to be immediately available, \$50,000.

Shoshone project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations and investigation of remainder of project, \$128,000: *Provided*, That no part of this amount shall be available for maintenance and operation of the Frannie division after December 31, 1926, and that any moneys which may be advanced for construction and operation and maintenance of the said Frannie division after that date shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which contributed in like manner as if said funds had been specifically appropriated for said purposes: *Provided further*, That the Secretary of the Interior is authorized to use so much of this amount as may be necessary in investigating the feasibility of discontinuing the operation of any portion of this project and removing the water users thereon to other lands elsewhere on the project and shall report hereon to Congress as early as may be practicable: *Provided further*, That not to exceed \$150,000 of the unexpended balance of the appropriation of \$414,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1171), shall remain available for the fiscal year 1927;

Secondary projects: For cooperative and general investigations, \$75,000;

Economic investigations and development of reclamation projects: For investigations necessary to determine the economic conditions and financial feasibility of new projects, and for investigations relating to the reorganization and financial adjustments of existing projects, including examination of soils, classification of land, and obtaining general economic and settlement data, \$100,000: *Provided*, That the expenditures from this appropriation for any reclamation project shall be considered as supplementary to the appropriation for that project and shall be accounted for and returned to the reclamation fund as are other expenditures under the reclamation act;

Under the provisions of this act no greater sum shall be expended, nor shall the United States be obligated to expend, during the fiscal year 1927, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1927

exceed the whole amount in the "reclamation fund" for the fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual conditions an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;

Whenever, during the fiscal year ending June 30, 1927, the commissioner of the Bureau of Reclamation shall find that the expenses of travel, including the local transportation of employees to and from their homes to the places where they are engaged on construction or operation and maintenance work, can be reduced thereby he may authorize the payment of not to exceed 3 cents per mile for a motor cycle or 7 cents per mile for an automobile used for necessary official business.

Total, from reclamation fund \$7,431,000.

For the share of the Government of the United States of the costs of operating and maintaining the Colorado River front work and levee system adjacent to the Yuma Federal irrigation project in Arizona and California, as authorized by the act entitled "An act authorizing the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," approved March 3, 1925 (Forty-third Statutes, p. 1186), \$35,000, or so much thereof as may be necessary, to be transferred to the reclamation fund, special fund, created by the act of June 17, 1902 (Thirty-second Statutes, p. 388), and to be expended under the direction of the Secretary of the Interior in accordance with the provisions applicable to appropriations made for the fiscal year 1927 from the reclamation fund.

For investigations to be made by the Secretary of the Interior through the Bureau of Reclamation to obtain neces-

sary information to determine how arid and semiarid, swamp, and cut-over timber lands in any of the States of the United States may be best developed, as authorized by subsection R, section 4, second deficiency act, fiscal year 1924, approved December 5, 1924 (Forty-third Statutes, p. 704), including the general objects of expenditure enumerated and permitted under the second paragraph in this act under the caption "Bureau of Reclamation," and including mileage for motor cycles and automobiles at the rates and under the conditions authorized herein in connection with reclamation projects, \$15,000.

\* \* \* \* \*

SEC. 2. Appropriations herein made for field work under \* \* \* the Bureau of Reclamation, \* \* \* shall be available for the hire, with or without personal services, of work animals and animal-drawn and motor-propelled vehicles and equipment.

Approved May 10, 1926. (Public No. 206.)

### *Columbia River Investigation*

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the provisions of the act of March 4, 1925, entitled "An act to permit a compact or agreement between the States of Washington, Idaho, Oregon, and Montana respecting the disposition and apportionment of the waters of the Columbia River and its tributaries, and for other purposes," be continued and extended, and the said States are hereby authorized to negotiate or enter into a compact or agreement and report to Congress in accordance with the provisions of the said act not later than December 1, 1927.

SEC. 2. There is hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, the sum of not more than \$25,000, for completing investigations of the feasibility of irrigation by gravity or pumping, water

sources, water storage, and related problems on the Columbia River and its tributaries, including the Columbia Basin project.

Approved April 13, 1926. (Public, No. 112.)

### *Fair Grounds, Shoshone Project*

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior be, and he is hereby, authorized and directed to cause a patent to issue conveying blocks 3, 4, 5, 14, 15, 16, and the east half of blocks 6 and 13, town site of Powell, on the Shoshone reclamation project, Wyoming, to Park County, Wyoming, in trust for use as a county fair grounds; but in said patent there shall be reserved to the United States all oil, coal, and other mineral deposits within said lands and the right to prospect for, mine, and remove the same.

SEC. 2. The conveyance herein is made upon the express condition that within thirty days of the receipt of any request therefor from the Secretary of the Interior the county clerk of Park County, Wyoming, shall submit to the Secretary of the Interior a report as to the use made of the land herein granted the county during the preceding period named in such request, showing compliance with the terms and conditions stated in this act; and that in the event of his failure to so report, or in the event of a showing in such report to the Secretary of the Interior that the terms of the grant have not been complied with, the grant shall be held to be forfeited, and the title shall revert to the United States, and the Secretary of the Interior is hereby authorized and empowered to determine the facts and declare such forfeiture and such reversion and restore said land to the public domain, and such order of the Secretary shall be final and conclusive.

Approved April 3, 1926. (Public, No. 91.)

### *Umatilla Project Bees Make Early Spring Start*

The Hermiston Herald states that honey bees on the Umatilla project, Oregon, are living up to their reputation of industry. The bees started to work earlier this year than ever before, and indications are that the honey flow will be better than in normal years.

J. Skovbo, a water user on the project who has a large apiary, took off several pounds of honey about the middle of March. To take new honey from a colony at this date establishes a new record for the project. Examination of the colonies showed that the bees were making more than enough honey to feed themselves.

According to the Bureau of Railway Economics, Idaho potatoes are shipped into 33 States, the maximum rail haul amounting to 2,970 miles.

### *Refund Certificate on Retirement Deductions*

The certificate of the administrative officer accompanying each application for refund of retirement deductions makes provision for the inclusion of service and deductions in other branches of the Government service. Field officers sometimes construe this part of the certificate as referring to service and deductions in the Bureau of Reclamation. The blanks in the paragraph immediately following the tabulation of deductions by fiscal years should not be filled in unless field offices have received information therefor in the form of a certified abstract of official record from another department, bureau, or office.

Potato shipments represent 34 per cent of the total rail shipments of all fruits and vegetables, according to the Bureau of Railway Economics.

### *Study of Farm Problems in Yakima Valley, Wash.*

A study of farm management problems on irrigated farms in hay and potato areas of the Yakima Valley, Wash., has been concluded recently by the Department of Agriculture. According to the report, "marketing possibilities for local farm products are among the principal factors in determining farm earnings in this area. Yakima Valley potato growers have several marketing advantages over their competitors in Northwestern States, chief among which are a low production per capita in Washington, resulting in a favorable local market, a shorter rail haul to Pacific coast cities, and the advantage of a rail-and-boat rate to California markets."

Well-balanced, palatable feeds are necessary to get good egg production.



# Newlands Project, Nevada, Agricultural Extension Program, 1926

*A comprehensive outline of what it is proposed to accomplish this season in bringing about better agricultural, livestock, and marketing conditions on the project through extension work*

*By L. E. Cline, associate agriculturist*

**A**GRICULTURAL extension work on the Newlands project will be conducted along lines emphasized in the following outline, providing that emergencies do not arise to make it necessary or desirable to make changes.

The subject that has been considered of first importance in agricultural extension work by this office for the Newlands project has been that of dairy development. This will take precedence over other lines of work during 1926. Under the head of dairy development will be the following activities, listed in the order of the emphasis that will be placed upon them during the year:

## DAIRY INDUSTRY

- A. Extension of the dairy industry.
  1. Selection of foundation animals and herds.
  2. Propaganda for popularizing dairying.
- B. Herd improvement.
  1. Herd testing.
    - (a) Organizing a 1926 herd-testing association.
    - (b) Interpreting results of herd testing for members of the association, and giving general publicity to herd-testing results.
  2. Culling inferior cows.
  3. Purebred-sire campaign.
- C. Herd management.
  1. Better animal husbandry.
  2. Better housing facilities.
    - (a) Publicity to stimulate building of new barns.
  3. Contagious-disease control in cooperation with State disease-control service.
  4. Nursing and handling of minor ailments of dairy animals.
    - (a) Special educational work along the lines of breeding troubles.
- D. Feeding.
  1. Supplemental grain feeds for local conditions, to be studied in connection with United States Experiment Station feeding tests.
  2. Mixed grass pasture demonstrations to be continued.
  3. Large pastures to be encouraged.
  4. Continued studies of mineral rations for producing cows.
  5. Silage supplements to alfalfa to be studied at feeding demonstration at United States Experiment Station, and results given to local dairymen.

6. Sweet clover and rye pastures for alkali lands to be encouraged.

## E. Importations.

1. Assisting project farmers in selection of dairy bulls for importations, when satisfactory ones can not be had locally.
2. Encouraging new settlers with dairy herds from outside the project to come in.

## POULTRY INDUSTRY

### TURKEYS

- A. Stimulating increased production.
  1. Pointing out local advantages for the industry.
  2. Stimulating interest in better housing.
- B. Feeding.
  1. To study feeding methods now in practice on the farms, and endeavor to determine the most successful one, and give it general publicity.
  2. Additional information to be secured on growing and fattening turkeys under farm conditions.
  3. Special emphasis to be placed on growing home feeds for turkey production.
- C. Disease control.
  1. Special efforts to be made in disseminating information on methods of combatting blackhead and chicken pox in turkeys.
  2. Further studies to be made of blackhead treatment.
- D. Marketing.
  1. Marketing of turkeys from the project, deserves much attention.
  2. General survey of the supply of turkeys on the Pacific coast, will be made the same as in 1925. A special effort will be made to attract buyers to this locality and discourage consigning turkeys to commission men.
  3. A continual effort will be made to encourage a superior product in the Fallon turkey, and to attract new buyers, whenever possible.

### CHICKENS

- A. Stimulating the chicken industry.
  1. An endeavor will be made to stimulate egg production as a side line to dairying for the purpose of utilizing skim milk.
  2. To offset the handicap of the alfalfa hay quarantine, an effort will be made to encourage poultry growing on more farms and the conversion of some of the alfalfa

acreage to corn and wheat production for feeding poultry.

3. A list of accredited hatcheries will be kept in the office and every effort will be made to encourage the buying of only high-class baby chicks.

## B. Feeding.

1. Proper rations for laying hens and growing chickens from locally grown feeds so far as possible.
2. More encouragement to be given producers of locally compounded poultry foods.

- C. Project egg-laying contest to be fostered in cooperation with State egg-laying contest, and publicity to be given the results.

- D. Greater emphasis to be laid on culling of farm flocks.

1. Demonstrations to be given showing the benefits from culling.

- E. Contagious disease control work to be done in cooperation with State disease control office.

1. Special lectures to be staged on poultry diseases at annual poultry school, to be held in February.

## F. Marketing.

1. An effort will be made to establish a new egg-marketing arrangement for the project.
2. Cooperative organization will be the goal.

## SHEEP PRODUCTION

- A. Stimulating the industry.
  1. General publicity will be given to possible profits in sheep husbandry on the project in an effort to encourage more farm flocks.
  2. A greater utilization of alfalfa hay is needed.
  3. Data to be gathered from local sheep farmers as to profits from farm flocks, and these figures to be used to encourage others.
- B. Permanent sheep pastures to be encouraged to facilitate handling sheep.
- C. Sources of supply for foundation farm flocks will be investigated and made available to prospective buyers.

## SWINE PRODUCTION

There seems to be ample justification for encouraging swine production on the project in 1926. Now that there is need to reduce the alfalfa acreage, greater production of grain must take its place, and since hogs provide a very profitable market for grain, with pork at present prices, it seems advisable to encourage swine production. Most of the dairy

(Continued on page 103)

## New Industry for the Orland Project

### Preserving Kadota Figs

By Mrs. Sadie Tolle, Orland, Calif.



Kadota fig-preserving plant, Orland project, California

ORLAND project, California, "The Project of No Regrets," has just begun to realize the possibilities of the Kadota fig industry. Of course, it was known generally that the Orland climate was ideal for fig growing. Long before the water came there were fig trees, mostly of the Black Mission variety, bearing heavy crops of figs year after year. But they were good only for drying, and people did not seem to be especially fond of dried figs. Then came the Kadota fig, golden fruit of honey sweetness, thin of skin and without seeds. Few fruits are so delicious when preserved.

However, little was known of the growing and bearing habits of the new variety. In 1919 a small nursery was established

near Orland. Even in the nursery row the baby trees bore figs. Every tree was planted. Some were set along the borders of the alfalfa fields. There were only enough trees for about 100 acres. That acreage was added to from year to year. Three and four-year old trees showed figs in every stage of development, for the Kadota fig bears almost continuously from the middle of July until frost.

#### BUILDING UP THE MARKET

Financially, the venture was still a failure, for there was no local market for the everincreasing supply. Canned figs were not found on many tables. In 1924 the growers organized the Orland Fig Growers Association, and in 1925 they

operated their own cannery, with the result that fig growing proved to be one of the most profitable industries on the Orland project. The cannery was not ready to receive fruit until August, and it closed the season's run on November 10, handling 11,799 pounds of fruit. The preserved product found a ready market, and large orders were turned down for want of fruit. During the latter part of the season part of the fresh fruit was candied, which proved even more profitable than preserving. The cannery employed 25 women and 5 men, and the organization plans to secure more spacious quarters and enlarge its force during the coming season.

#### INCREASED ACREAGE ASSURED

Kadota fig trees are headed close to the ground, thus making the harvesting easy. Last season many school children picked figs, finding profitable employment during vacation. The 1925 project crop census report gives the acreage of bearing figs as 125 acres, but there are close to 500 acres set out to Kadota figs within the project, and no doubt many more trees will go in this coming spring. All kinds of soils are included in the acreage already in figs and the trees seem to do well in each. On one farm where the trees are planted along the alfalfa border, the yield and quality of fruit proved equal to any.

#### REVENUE WITHOUT WORRY

The Kadota fig is practically free from disease and insect pests and when once established needs little care or pruning. After a fig orchard comes into bearing the owner need have no worries that his trees will wear out and die off, as no other fruit tree is so long lived as the fig tree.

And so another industry is added to the Orland project's resources, whereby more dollars will come to the settlers to be put back into comfortable homes. When you want something that is most delicious try a glass of preserved Kadota figs.

## Newlands Project Extension Program

(Continued from page 102)

farms can handle hogs to advantage as a side line.

Cooperative marketing of hogs will be taken up again when there are sufficient hogs to justify it.

#### RABBIT PRODUCTION

The production of rabbits for meat purposes will receive its due amount of attention. It is an industry worth encouraging on the Newlands project. This work will be taken up under the following heads:

- A. General management.
- B. Housing accommodations.
- C. Disease control.
- D. Marketing.

#### FARM CROPS

The encouragement of corn growing will be emphasized. Treatment of seed wheat for smut will receive greater emphasis this coming year. The spraying of fruit trees will be taken up at the proper time. The treatment of potato seed to combat potato diseases will be emphasized at the proper time. The growing of Fallon celery justifies increased attention for local and near-by markets.

#### OTHER ACTIVITIES

Attention will also be given to publicity, boys' and girls' club work, and rodent control.

## Production of Daughters Shows Value of Dairy Sire

The best way to determine the true value of the dairy bull is through the production records of his daughters. If a dairy bull has many daughters, and all of these excel medium to low-producing dams, the sire has a certain value; if all the daughters excel medium to high-producing dams, the true value of the bull is comparatively high; but if all the daughters excel high-producing dams, the true value of the bull is very high.

## Cost of Producing Apples and Pears On a Large Orchard, Yakima Project

THE cost of production is always a subject of great importance to the farmer as well as the Bureau of Reclamation, and the following costs obtained from one of the large orchards of the Yakima irrigation project, Washington, are of rather more than ordinary interest on account of their clearness and accuracy.

This orchard is owned by nonresidents, but is in charge of an experienced and efficient manager. Absolutely every item of cost must be paid for and is taken into the books. Also, such items as depreciation, interest on loans, taxes, and even loss on livestock are taken into consideration, and the owners carry their own insurance on both fruit and buildings, which is included in the actual cost.

The tract consists of 228 acres, of which 211 are irrigable, 176 being in orchard and the balance in alfalfa and open ground. The main crops are cherries, pears, and apples. The cherries would cover about 4 acres, but line the main roadway and because of their location are charged only with the expense of harvesting and any other expense directly chargeable to them. In 1925 they sold 31,670 pounds of cherries, which cost

\$0.0216 to pack and put in the market 9 miles away.

Because of the planting of the orchard it is impossible to separate the pears and the apples. The 1925 crop was 60,158 boxes of apples and pears, of which 11,812 were sold in bulk. In arriving at the cost of production, however, the bulk fruit was figured on a packed basis.

### COST OF A BOX OF APPLES

The 1925 cost of growing, harvesting, packing, and loading a box of apples or

pears was \$0.851, the principal items entering into this cost being as follows:

	Per box
Picking-----	\$0.119
Packing-----	.1566
Box-----	.160
Loading-----	.0164
Grading fruit-----	.0475
<hr/>	
Total harvesting and packing expense-----	0.4995
Irrigation-----	.0264
Pruning-----	.0159
Taxes-----	.0158
Thinning-----	.0483
Spraying-----	.0937
Depreciation-----	.0218
<hr/>	
Total-----	.7214

Had it been a straight apple orchard the cost per box would have been a little higher.

The ranch is well equipped in every way, including an adequate packing house. All fruit was packed on the ranch and the pears and apples hauled to cars on a spur track one-half mile from the ranch.

## Name Your Farm Home

The naming of the farm home is often the first step in general home improvement. There is an effort to live up to the spirit which has been embodied in the new name. The indirect effort of the name can often be seen in the grading and standardizing of products offered for sale.

Farm home owners should give considerable thought to the selection of the right name. It should be dignified, suitable, lasting, not too common, easy to say, easy to read, and easy to remember. It should appear on the mail box or over it, or on a signboard, or on the gate. It should be used on letterheads and on the label of anything sold from the farm.

A number of States have laws providing for the registry of farm names. Lists of several hundred suggested farm names were printed in the Reclamation Record from June to November, 1918. Turn to your back files of the Record and select a suitable name; or write us a description of your farm and its surroundings and we will be glad to send you a list of names from which selection may be made.

## Objects of Keeping Good Dairy Records

Cow testing and diary records, while determining the absolute and relative yield capacity of cows, should be used—

1. For the elimination of cows whose yield is economically inadequate.
2. For the choice of the best milkers for purposes of reproduction.
3. For the selection of choice bulls on the basis of the dairy qualities of the dams, sisters, and, more particularly, the female progeny.
4. For the consequent establishment of families and lines whose milk is characterized by high fat content.
5. For improving the hygiene and feeding of the cows so as to obtain the maximum yield corresponding to their genetic constitution.
6. For genealogical and genetic experiments with special reference to the powers of transmitting the characteristics of good milking and butter fat content.—Dairy cow testing in different countries, International Institute of Agriculture.

## Yakima Project Paper Notes Tieton Progress

"For a time we seldom got into a public meeting around here in which we did not have to listen to howls of anguish from the people up on the Tieton Government irrigation project. They all seemed to think that they were going broke, and the indications were that that was just about what would happen. The main trouble was that farmers up there had planted their lands mostly to trees and they did not have capital enough to carry on their operations until the returns began to come in, and about the time they did come the market went to the bad. Things are entirely different up on the Tieton to-day. Plans of a great many people having been worked out and a couple of good years having come along, that district has become one of the most prosperous in the Yakima Valley. It is also highly gratifying to find that it turns out to be one of the best. The Tieton soil is better than was suspected. The district is almost frost proof. The Tieton is now a steady and regular producer and the quality of its fruit probably is not surpassed anywhere on the American continent. At the present time the Tieton unit adjoining town is one of the most beautiful parts of the Yakima country. People who drive about will miss something if they neglect to take the grade up past the Garretson place and ramble around over the finely improved roads out beyond for a few hours most any day of this spring."—Yakima Republic, April 28, 1926.

## Buy Right Variety of Alfalfa Seed



Cutting alfalfa on the Newlands project, Nevada

**B**EFORE buying alfalfa seed there are three points upon which the purchaser should have information. They are: The name of the variety, the section of the country in which it was grown, and the quality of the seed with regard to both germination and purity.

The alfalfas of this country vary in their adaptation to climatic conditions and length of day, some giving the best results in the North and Northwest, whereas others succeed only in the South and Southwest. As an aid to the prospective grower of alfalfa in determining the variety to grow, Farmers' Bulletin 1467-F, Commercial Varieties of Alfalfa, discusses in detail the origin, adaptability, and establishment of five distinct groups and their subdivisions. The five groups are: Common, Turkestan, variegated, nonhardy, and yellow flowered.

Unfortunately it is not possible to distinguish between the varieties or strains of alfalfa by the appearance of the seed, and the tests that have so far been developed to assist in this connection are not of much practical benefit to the farmer. It is important, therefore, that dealings be had only with thoroughly reliable and intelligent seedsmen and growers.

The variability of the seed, or its ability to start a strong plant, is clearly indicated in its appearance. Plump seed of a bright olive-green color almost invariably germinates well, while shriveled seed or seed that is of a brownish color usually germinates poorly. With age alfalfa seed turns a reddish-brown color. When a germination test is desired it can be made by placing 100 seeds between cloths or

blotting paper and keeping them moist and at a temperature of about 70° F. After five or six days most of the viable seeds will have sprouted.

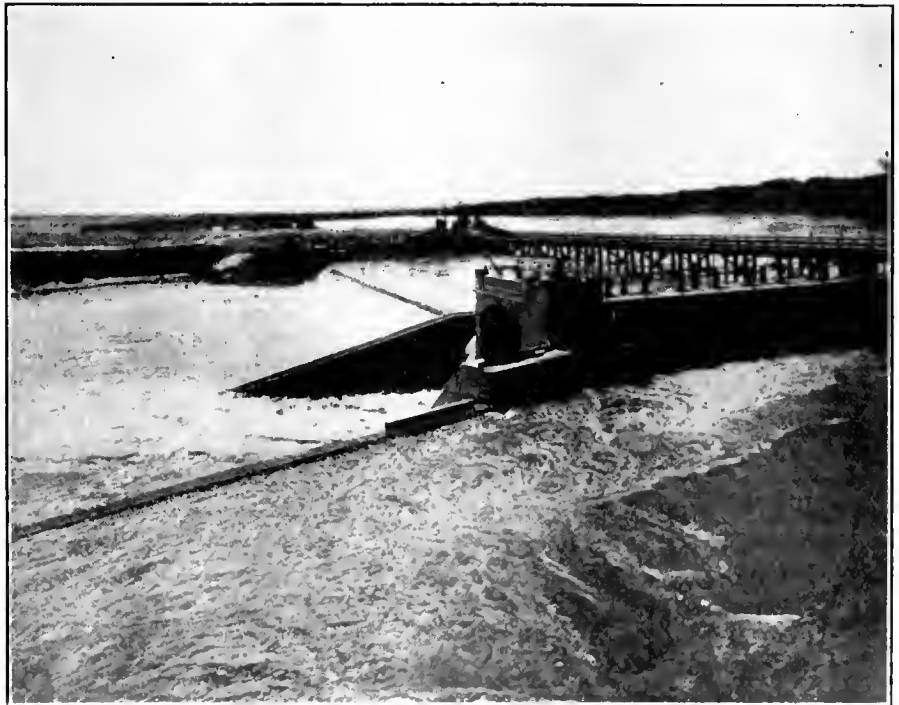
With regard to the purity of alfalfa seed, every farmer should be able to recognize readily the most important weed seeds and other impurities that are commonly found in it. Seed to be acceptable should not contain more than 2

per cent impurities. At the present time there is almost no attempt to adulterate alfalfa seed in this country, but every lot should be very carefully examined for seed of noxious weeds, especially dodder, before it is purchased. The seeds of dodder are smaller than those of alfalfa, more nearly round, and have a pitted surface which can be detected only by the aid of a lens. Dodder is a troublesome weed, and dodder-free seed should be demanded by the purchaser.

Different alfalfa varieties have been produced mostly in nature, with almost no intentional effort on the part of man. The hybrid varieties are natural crosses, and the distinct types of pure origin are the products of natural selection. However, it is hoped that the results of systematic plant breeding will be soon available to the general public, and that these efforts will produce strains or varieties that will be superior even to the best commercial ones now available.

A copy of the bulletin may be secured, as long as the supply lasts, by writing to the United States Department of Agriculture, Washington, D. C.

**S**EVEN applications, three of which were from ex-service men, for farms on the Riverton project. One of the ex-service men appeared before the examining board and was found to be properly qualified and assigned a farm unit. The other two are expected to meet with the board in the near future.



Whalen diversion dam, North Platte project, Nebraska-Wyoming

## Notes From Our Projects 10 Years Ago

From the Reclamation Record of June, 1916

THE duties and authority of the Reclamation Service should be enlarged. In addition to the building of irrigation works, it should be given authority to prepare land for irrigation, and in some instances complete necessary improvements so that settlers can begin immediately the cultivation of the soil. The reason for this change is that leaving it to inexperienced settlers wastes money and time, delays settlement and the resultant income from water sales. It would be a good business policy. It is also what settlers most need to overcome the serious obstacles they now have to face.

Since the beginning of the century over a billion dollars has been furnished by different Governments to enable men of small capital to own the land they cultivate; the results have been little less than marvelous. In Australia it has created a new kind of agriculture, more than doubled the income from the State irrigation works, and caused new ones to be built by the State.

The principal features of all these systems are the same. They require that each settler shall have a certain minimum capital; shall be honest and industrious. To such settlers the State either makes the improvements needed to enable them to begin cultivation, the settlers paying part of the cost, or it loans the settler up to 60 per cent of the value of improvements after he has made them. The average interest rate under these systems is less than half what settlers have to pay here; the time of repayment is from 10 to 20 times as long as can be obtained here, and in addition, the payments are amortized, which is a feature of great value. To this financial aid there is added practical advice and direction to save the inexperienced beginners from costly mistakes and to see that they do the right thing at the right time.

If the Reclamation Service could introduce this system on its projects it would lift the burden of usurious interest from the necks of many settlers, insure the complete development of all districts,

and make the act help many ambitious and deserving people to secure a home who can not attempt it under present conditions.—From an article by Dr. Elwood Mead on "A needed increase in the scope of the work of the Reclamation Service."

Substantial progress in the development of the Government reclamation projects is indicated by the census figures for irrigation and crop results in 1915. The total area watered and cropped under canals operated by the Government increased more than 50,000 acres over the previous year, bringing the irrigated acreage above 800,000 and the area from which crops were harvested to over 750,000 acres.

During 1915 the average for all reclamation projects in value of crops per acre was \$24, an increase of 50 cents per acre in comparison with the statistics for 1914. At the same time the total production increased one and a half million dollars to over \$18,000,000.

Two projects were added to those producing annual crops worth over a million dollars, the Uncompahgre, Colorado, and the North Platte, Nebraska-Wyoming. The Salt River project, Ari-

### ANNUAL WATER CHARGES ON FEDERAL IRRIGATION PROJECTS—SEASON OF 1925 AND 1926

State	Project	Minimum charge per acre		Number of acre-feet delivered for minimum charge		Acre-foot charge in flood season		Acre-foot charge not in flood season		Acre-foot charge entire season		Charge for additional water per acre-foot	
		1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
Arizona	Salt River <sup>1</sup>												
Arizona-California	Yuma	\$5.00	\$5.00	3, 4	3, 4							\$1.00	\$1.00
California	Orland	1.60	1.60	2½	2½							1.25, .50	1.25, .50
Colorado	Grand Valley	1.25	1.25	2½	2½							.75	.75
	Uncompahgre	1.15	1.15	3	3							.35	1.35, .40
	King Hill <sup>2</sup>	1.50	1.50	4	4							.35	.40
Idaho	Minidoka:												
	S. S. Pumping	1.50	2.25		2½	\$0.40		\$0.90					.30
	Gravity <sup>3</sup>												.30
Montana	Boise	1.00	.85		3	.30		.40					.30
	Huntley	1.50	1.50			.60	\$0.60	1.10	\$1.10				
	Milk River									\$1.00	\$1.00		
	Sun River:												
	Fort Shaw	1.10	1.15	1¼	1½							.50	.50
	Greenfields					.60	.60	1.00	1.00				
Montana-North Dakota	Lower Yellowstone <sup>4</sup>												
Nebraska-Wyoming	North Platte:												
	Interstate	2.00	2.00	3	3							.50	.50
	Fort Laramie <sup>5</sup>												
	Northport <sup>6</sup>												
Nevada	Newlands	2.00	2.00	2¼, 3, 4½	3, 4½							\$1.10-.80	\$1.10-.80
New Mexico	Carlsbad	1.50	1.50	2	2							.60	.50
New Mexico-Texas	Rio Grande <sup>7</sup>												
Oregon	Umatilla <sup>8</sup>												
Oregon-California	Klamath:												
	Main <sup>9</sup>												
	Tule Lake	1.65	1.85	2	2							1.50, .75	1.50, .75
South Dakota	Belle Fourche <sup>10</sup>												
Utah	Str. Valley	1.30	.70	2	2							.65	.35
Washington	Okanogan <sup>11</sup>												
	Yakima:												
	Sunnyside	2.00	1.80	3, 3½, 4½	3, 3½, 4½							1.00	1.00
	Tieton	2.00	2.00			.75	.75	1.20	1.50				
Wyoming	Riverton		1.00		2					.75			.50
	Shoshone:												
	Garland	1.05	1.25	2	2½							.45	.20
	Frannie									.55	.55		

<sup>1</sup> Operated by Salt River Valley Water Users' Association.

<sup>2</sup> First additional foot, \$0.25; further quantities, \$0.50.

<sup>3</sup> First additional foot, \$0.35; further quantities, \$0.40.

<sup>4</sup> Projects under contract with irrigation districts to pay actual cost of operation and maintenance.

<sup>5</sup> Operated by Minidoka irrigation district.

<sup>6</sup> First additional foot, \$0.10; second additional foot, \$0.20; third additional foot, \$0.40; fourth additional foot, \$0.80.

<sup>7</sup> First additional foot, \$0.50; further quantities, \$0.75.



zona, continues to lead in total returns with crops worth \$3,660,000, closely followed by the Yakima project, Washington, producing from less than half as large an area crops estimated at \$3,418,000.

The steady progress accomplished on the Huntley project, Montana, is brought out in the project manager's annual operation report. The reclamation extension act, accepted by practically all the water users, greatly improved their immediate financial condition. Additional buildings were erected and the population of project farms and towns showed a steady increase. By an overwhelming majority the water users voted for the construction of drainage works at a cost up to \$15 per acre.

The year 1915 was the most favorable in the history of the Okanogan project, Washington. The principal obstacle to speedy success is the burden of indebtedness carried by the water users in the shape of farm mortgages at high interest rates. This burden, in effect a heavy charge for the raw land irrespective of the irrigation works, acts as a drain on the irrigators' resources, absorbing the returns

## The Water Supply on the Projects

*With the exception of Colorado, irrigation waters to be derived from snow will be below normal. Deficiencies in run-off will probably be most marked in the Pacific Northwest.*

*Light irrigation shortages are anticipated for the Milk River project, Montana, the Umatilla project, Oregon, and for the Truckee lands of the Newlands project, Nevada, although in the case of the last named, conditions are more favorable than at the end of April. A serious shortage now appears unavoidable on the Okanogan project, Washington.*

*All other reclamation projects are at this time assured of an ample supply of irrigation water.*

*The Colorado River may reach very low stages in late summer, owing to abnormal conditions in the Green River Basin in Wyoming, which may result in a deficient supply for the Imperial Valley of California. The Salt River project, Arizona, will be to a large extent dependent on its pumps or its water supply.*

that should be going to build up the farms, increasing the live stock, building, and farm equipment.

The Elephant Butte Dam, the principal engineering feature of the Rio Grande project, New Mexico-Texas, was completed Saturday afternoon, May 13, 1916, at 4 o'clock.

The water-users' association on the Sun River project is in consultation with the service regarding the organization and administration of irrigation districts with particular reference to taking over the maintenance and operation of the Fort Shaw unit.

The setting of the first bench mark on Yuma Mesa, the frostless citrus fruit land of the Yuma project, was the occasion of a simple ceremony on May 1, 1916. Col. B. F. Fly, who as representative of the valley, came to Washington and obtained approval of the reclamation commission for a survey of the first unit, is shown in the accompanying illustration placing the first shovel of dirt around the post.

### COMPARATIVE COLLECTIONS: IS YOUR PROJECT SHOWING ANY IMPROVEMENT?

State	Project	Construction				Operation and maintenance			
		March, 1925	March, 1926	Fiscal year 1925, to Mar. 31, 1925	Fiscal year 1926, to Mar. 31, 1926	March, 1925	March, 1926	Fiscal year 1925, to Mar. 31, 1925	Fiscal year 1926, to Mar. 31, 1926
Arizona	Salt River			\$599,326	\$643,862				
Arizona-California	Yuma	\$15,483	\$12,212	343,318	334,179	\$45,738	\$37,828	\$290,948	\$216,332
California	Orland	9,077	5,213	28,540	76,321	2,682	1,358	24,994	32,857
Colorado	Grand Valley	(1)	(1)	(1)	(1)	5,408	7,392	32,281	43,812
	Uncompahgre	262	27,923	24,108	90,837	2,513	21,010	70,274	108,892
Idaho	King Hill							71	161
	Minidoka:								
	Gravity	2,748	14,833	58,425	101,031	12,639	11,651	12,639	11,651
	S. s. pumping	1,288	7,163	29,851	68,856	1,732	2,462	35,989	46,500
	Jackson Lake	324		31,970	39,982			9	111
Montana	Boise	800	1,666	142,427	115,833	14,503	11,642	82,951	129,833
	Huntley	366	1,175	16,895	21,514	724	2,263	25,771	28,611
	Milk River	(1)	(1)	(1)	(1)	1,099	3,693	13,563	14,206
	Sun River:								
	Fert Shaw	7	333	6,130	6,356	243	329	6,441	6,637
	Greenfields	(1)	(1)	(1)	(1)	219	333	10,732	12,637
Montana-North Dakota	Lower Yellowstone	724	33	3,350	10,549	2,595	88	5,221	10,604
Nebraska-Wyoming	North Platte:								
	Interstate	54	4,811	24,144	23,937	1,420	1,983	37,892	38,025
	Fort Laramie	(1)	(1)	(1)	(1)	2,535	60	29,603	33,166
	Storage	1,044		31,989	17,159	647	430	6,864	3,014
	Northport							22,748	23,381
Nevada	Newlands	2,833	3,060	33,028	48,503	8,180	8,801	79,034	107,956
New Mexico	Carlsbad	3,084	1,777	66,313	44,913	2,827	1,311	63,510	35,232
New Mexico-Texas	Rio Grande	147,051	93,200	180,901	211,394	153,264		201,763	72,683
North Dakota	Williston								
Oregon	Umatilla			5,730	257	104		17,579	7,900
Oregon-California	Klamath	1,387	235	59,684	32,089	176	440	49,334	36,454
South Dakota	Belle Fourche								
Utah	Strawberry Valley	462	11,000	62,866	91,620	329	333	28,944	29,913
Washington	Okanogan	847	4,382	1,068	4,605	3,103	19,177	3,998	29,184
	Yakima:								
	Sunnyside	4,580	64	49,993	108,123	28,454	14,623	42,737	71,019
	Tieton	12,693	15,427	107,216	151,105	8,005	11,113	70,098	72,724
	Storage	5,060	5,060	25,435	80,675	829	1,195	15,879	16,996
Wyoming	Shoshone:								
	Garland	266	1,873	8,465	23,730	1,107	2,409	12,389	34,032
	Frannie					40		486	
Total		210,440	211,440	1,941,172	2,347,520	301,015	161,945	1,292,742	1,274,522

<sup>1</sup> Projects on water-rental basis.

## Organization Activities and Project Visitors

COMMISSIONER MEAD is planning for a western trip which will keep him in the field for two or more months, leaving Washington about the middle of June. Many of the newer developments will be visited by the commissioner, as well as those projects where more intensive settlement campaigns are in progress.

George C. Kreutzer, director of reclamation economics, left the Washington office early in May for a field trip of several months.

Dr. Ing. Y. Shen, of China, was a recent visitor on the Yuma project. Dr. Shen has just completed his education in Germany and is studying flood-control work in connection with the Yellow River in China.

Julian Hinds, engineer in the Denver office, was on the Orland project recently to inspect the Stony Gorge dam site and other features relating to the proposed supplemental construction. A geological examination of the dam site was made by C. D. Hulin, assistant professor of geology at the University of California.

C. C. Elder, engineer in the Denver office, has been investigating the water supply for the Dubois project.

W. Y. Cannon, manager of the Utah-Idaho Sugar Co., and C. D. Greenfield, agricultural and development agent of the Great Northern Railway, were recent visitors on the Milk River project.

F. J. Hanagan has been appointed treasurer and William H. Tuller assistant engineer for the board of control of the Boise project.

Ronald E. Rudolph, senior clerk on the Boise project, has been transferred to the Kittitas division of the Yakima project.

Miss Martha C. Hansen, clerk on the Boise project, has been transferred to the Minidoka project.

Vanford A. Anderson, clerk on the Boise project, has been transferred to the United States Veterans' Bureau at Boise.

Effective April 17, 1926, Maurice G. Ricker, editor of Motion Picture Films, has been placed in charge of the photographic laboratory of the Washington office of the Bureau of Reclamation. Mr. Ricker has been assigned to the Division of Settlement and Economic Operations, and will carry on his work and report to the commissioner through the chief of that division.

*Delegates from the following projects have been in the Washington office recently in connection with affairs on their respective projects:*

*Uncompahgre.—C. J. Moynihan and William P. Dale.*

*Huntley.—Superintendent McGinness, J. Homer Hancock, and C. D. Howe.*

*North Platte.—James T. Whitehead; William Morrow.*

*Shoshone.—George W. Atkins.*

United States Attorney Springmeyer, United States Commissioner Anna M. Warren, District Counsel R. J. Coffey, Attorney Roy W. Stoddard for the irrigation districts, and Attorney George Sanford for the upstream water users, were in Fallon, Newlands project during April to take depositions from old Lahontan Valley residents in connection with the Carson River adjudication suit.

A. C. Cooley, agriculturist in charge of demonstrations on reclamation projects, visited the Newlands office recently to discuss project agricultural matters.

Mr. Strohm, of the Worthington Pump Co., was on the Klamath project in April making alterations and tests on the Dry Lake pumping plant.

Mr. Chase and Mr. Newson, Southern Pacific engineers, called at the Klamath project office recently in connection with the location of the proposed Modoc Northern across the Tule Lake division.

E. A. Inghan, representative of Clyde C. Kennedy, engineer of San Francisco, was in the Klamath project office during April to obtain hydrographic data in connection with a preliminary survey for a sewage system and disposal plant for Klamath Falls.

Recent visitors to the Strawberry Valley project included District Counsel J. R. Alexander, Inspector C. A. Lyman, and Messrs. A. C. Cooley and E. R. Price of the Department of Agriculture.

C. M. Day, mechanical engineer from the Denver office has completed the tests of the 60-inch balanced needle valves at Tieton Dam, Yakima project.

A. E. Kocher, of the Bureau of Soils, spent several days on the Kittitas division of the Yakima project reclassifying certain areas under the North Branch Canal.



Irrigating onions on the Rio Grande project, New Mexico-Texas

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

**E. C. Finney**, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor for the Interior Department  
**E. K. Burlew**, Administrative Assistant to the Secretary; **J. H. McNeely**, Assistant to the Secretary; **W. B. Acker**, Chief Clerk

*Washington, D. C.*

**Elwood Mead**, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

P. W. Dent, Assistant to the Commissioner

C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

*Denver, Colorado, Wildo Building*

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Acting Chief Clerk; Harry Cadan, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	J. B. Bond.....	W. C. Berger.....	W. C. Berger.....	Ottamar Hamels.....	El Paso, Tex.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	J. P. Siebenicher.....	M. M. Wilson.....	E. E. Roddis.....	Billings, Mont.
Huntley.....	Ballantine, Mont.....	A. R. McGinness.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
King Hill <sup>2</sup> .....	King Hill, Idaho.....	H. D. Newell.....	E. R. Schepplmann.....	E. R. Schepplmann.....	E. E. Roddis.....	Billings, Mont.
Klamath.....	Klamath Falls, Oreg.....	H. A. Parker.....	E. E. Chabot.....	E. E. Chabot.....	do.....	do.
Lower Yellowstone.....	Savage, Mont.....	G. E. Stratton.....	O. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Boise, Idaho.
Milk River.....	Malta, Mont.....	E. B. Darlington.....	G. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
Minidoka.....	Burley, Idaho.....	D. S. Stuver.....	L. H. Mong.....	N. D. Thorp.....	Wm. J. Burke.....	Mitchell, Nebr.
Newlands.....	Fallon, Nev.....	H. W. Bashore.....	W. D. Funk.....	N. D. Thorp.....	H. L. Holgate.....	Portland, Oreg.
North Platte.....	Mitchell, Nebr.....	Calvin Casteel.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Okanogan.....	Okanogan, Wash.....	R. C. E. Weber.....	V. G. Evans.....	L. S. Kennicott.....	Ottamar Hamels.....	El Paso, Tex.
Orland.....	Orland, Calif.....	L. M. Lawson.....	R. B. Smith.....	V. E. Hubbell.....	Wm. J. Burke.....	Mitchell, Nebr.
Rio Grande.....	El Paso, Tex.....	H. D. Comstock.....	W. F. Sba.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Riverton.....	Riverton, Wyo.....	C. C. Cragin <sup>4</sup> .....	H. R. Pasewalk.....	H. R. Pasewalk.....	J. R. Alexander.....	Montrose, Colo.
Salt River <sup>3</sup> .....	Phoenix, Ariz.....	L. H. Mitchell.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Shoshone.....	Powell, Wyo.....	W. L. Whittemore.....	C. M. Voyer.....	C. M. Voyer.....	H. L. Holgate.....	Portland, Oreg.
Strawberry Valley.....	Provo, Utah.....	G. O. Sanford.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	H. M. Schilling.....	R. K. Cunningham.....	J. C. Oawier.....	H. L. Holgate.....	Portland, Oreg.
Umatilla.....	Hermiston, Oreg.....	L. J. Foster.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.
Uncompagne.....	Montrose, Colo.....	J. L. Lytel.....				
Yakima.....	Yakima, Wash.....	P. J. Preston.....				
Yuma.....	Yuma, Ariz.....					

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>5</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Boise, Idaho.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>5</sup> .....	Chas. Klingman.....	L. J. Windie.....	Wm. J. Burke.....	Mitchell, Nebr.
Umatilla, McKay Dam.....	McKay Dam, Oreg.....	R. M. Conner <sup>5</sup> .....	C. B. Funk.....	W. S. Gillogly.....	H. L. Holgate.....	Portland, Oreg.
Kittitas.....	Ellensburg, Wash.....	Ralph Lowry <sup>5</sup> .....	E. R. Mills.....		H. L. Holgate.....	Portland, Oreg.
		Walker R. Young <sup>5</sup> .....				

<sup>1</sup> Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.

<sup>2</sup> Project operated by King Hill Irrigation district.

<sup>3</sup> Project operated by Salt River Valley Water Users' Association.

<sup>4</sup> General Superintendent and Chief Engineer.

<sup>5</sup> Resident Engineer.

<sup>6</sup> Construction Engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Sacramento Valley.....	Ellensburg, Wash.....	Walker R. Young.....	Sacramento Valley Development Association and State of California.
Dubois.....	American Falls, Idaho.....	F. A. Banks.....	Dubois Project Finance Association.
Milk River eastern tributaries.....	Hermiston, Oreg.....	E. R. Crocker.....	
Spanish Springs storage.....	Fernley, Nev.....	A. W. Walker.....	
Harney Valley.....	Boise, Idaho.....	R. J. Newell.....	
Owyhee.....	do.....	do.....	
Vale.....	do.....	do.....	
Salt Lake Basin.....	Salt Lake City, Utah.....	W. M. Green.....	State of Utah.
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	State of Wyoming.

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



FLAT IRRIGATION ON DESERT LAND



BORDER METHOD OF IRRIGATION



IRRIGATING POTATOES



IRRIGATING AN ORANGE GROVE



A CONCRETE LINED IRRIGATION CANAL



FURROW METHOD OF IRRIGATION

# NEW RECLAMATION ERA

VOL. 17

JULY, 1926

NO. 7



IMMENSE QUANTITIES OF TOMATOES ARE GROWN FOR CANNING ON THE IRRIGATION PROJECTS OF THE BUREAU OF RECLAMATION



*AS a result of the final enactment of the Omnibus Reclamation Adjustment Law, Federal irrigation projects will be shrunken to include only fertile lands capable of producing crops, according to a statement made recently by Secretary Work of the Interior Department.*

*"At the present time," stated Secretary Work, "many of the projects comprise thousands of acres of lands that are infertile, nonirrigable, seeped or otherwise unproductive. The effect of this new law will be to eliminate these lands from the projects entirely and retain only such areas as are capable of bearing their proportionate share of construction charges levied against them.*

*"This means that the farmers on the projects will not have to pay the construction costs of canals and works built to irrigate these unproductive lands. With the shrinkage of the projects these costs will be charged off as a loss to the Government, and the farmers will be relieved of paying them.*

*"Enactment of this law resulted from a comprehensive study of Federal reclamation started two years ago. A Fact Finders' Commission was appointed which after months of investigation made definite recommendations. A Board of Survey and Adjustments was then constituted that went over the projects classifying the lands in accordance with their productivity and recommending that the Government charge off construction costs against nonirrigable lands. With this final reappraisal and adjustment of reclamation, farmers should now be able to proceed with the successful development of their farms and ultimately own their own homes."*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

JULY, 1926

No. 7

## *Interesting High Lights on the Reclamation Projects*

**T**HE Yuma project shipped 251 carloads of agricultural products during the month valued at \$76,350. The total value of the 1,475 carloads of such shipments since the first of the year amounts to \$1,350,000.

**A**PRICOTS on the Orland project were beginning to ripen and a large yield with remunerative prices is anticipated. The bulk of the crop will be shipped to a Sacramento plant at a price of \$65 a ton, f. o. b. cars at Orland.

**T**HE Mesa County Irrigation District, Grand Valley project, paid on the due date of June 1 the semiannual installment of \$2,450 as required by their contract. The Palisade Irrigation District also met their obligations on the same date. The latter district has never yet been delinquent 24 hours in their payments to the Government.

**T**HE development of Orchard Mesa, Grand Valley project, has continued with a considerable increase in cultivated area and a noticeable improvement in the construction of buildings and fences. Approximately 5,000 acres of this land is being farmed, which is an increase of 100 per cent over the area in 1921. The farmers in this district are very optimistic over their prospects, and the development of the remaining area should be rapid.

**T**HE first shipment of eggs by the newly organized Churchill County Poultrymen (Inc.), Newlands project, left Fallon recently for Los Angeles when 24 local farmers joined in a trial to determine returns from outside markets. Heretofore shipments to outside points have been made by express to San Francisco at approximately 3½ cents per dozen. The refrigerator freight plan offers a lower rate of 2½ cents per dozen to the more distant markets.

**L**AHONTAN Reservoir, Newlands project, although lowering quite rapidly under heavy draft, small inflow, and warm weather conditions, still contains enough storage to supply the Carson division without possibility of shortage.

**O**N MARCH 1 on the Uncompahgre project 1,028 delinquent accounts were mailed from the project office. The response to these notices has been very gratifying, and at the end of June 1922 delinquent accounts had been cleared for water for the irrigation season by payment of the charges due.

**T**HE American Falls reservoir, by tiding over the period while the river was extremely low and storage was still in progress at Jackson Lake, and also by making it possible to maintain satisfactory power heads at Lake Walcott, was of inestimable service to lower valley water users.

**A** CREAM pool for the Minidoka project has been organized under the name of the Mini-Cassia Dairymen's Association, with headquarters at Burley, Idaho. About 1,600 cows have been signed up for the pool.

**G**OOD progress continues to be made by the Utah Construction Co. on the construction of American Falls Dam. Approximately 25,000 cubic yards of concrete were poured during the month. Storage in the reservoir began to be released on May 1 at which time 112,500 acre-feet were stored.

**W**ORK on lining the spillway channel at McKay Dam, Umatilla project, has been carried on without interruption, and work has been continued on placing the concrete paving on the upstream face of the dam. The average thickness of the concrete poured was about 10 inches.

**G**RASSHOPPERS have been giving serious trouble on the Tule Lake leased lands, Klamath project, and about 400 acres of grain were destroyed. Poisoned grain and a grasshopper burner have been used to control the pests.

**T**HE Belle Fourche project received considerable publicity through the "Sugar Beet Special" which the Great Northern sent over the project recently. The demonstrations and talks on beet agriculture attracted large crowds at Belle Fourche and Nisland and indicated a widespread interest in this crop.

**A** check for \$40,000 was received recently by the bureau from the Belle Fourche irrigation district to cover required operation and maintenance payment, and at the close of the month the total collections for this feature, including credits, amounted to \$55,000.

**T**HE delinquent list on the Tieton division of the Yakima project at the close of May was the smallest for a number of years, and the acreage entitled to and receiving water, either by the payment of charges or through the acceptance of notes and mortgages, for regular use and for transfer purposes, will probably run higher than the 1922 maximum of 31,150 acres.

**D**URING May five additional applications were received for farms on the Riverton project. Three of these were from ex-service men. All of the applicants live at a considerable distance from the project and none has yet appeared for examination as to settlement qualifications.

**D**IAMOND drill explorations have been in progress at Gibson Dam site, Sun River project. At the end of May eight holes, with a total of 508 linear feet 10 inches, had been completed.

## The Omnibus Bill as Passed and Approved by the President

*The approval of this bill on May 25, 1926, provides for the definite write-off of charges amounting to \$14,667,965 and the suspension of charges amounting to \$12,788,406*

**B**E it enacted by the Senate and House of Representative of the United States of America in Congress assembled, That the Secretary of the Interior be, and he is hereby, empowered and directed to make, under subsection K, section 4, Act of December 5, 1924 (Forty-third Statutes at Large, page 701), in connection with the irrigation projects hereinafter named, adjustment of water-right charges standing upon the records of said projects as of June 30, 1925, as follows:

### BELLE FOURCHE PROJECT, SOUTH DAKOTA

SEC. 2. There shall be deducted from the total cost of said project the following sums:

(1) \$355,809, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) One thousand two hundred and eight acres permanently unproductive because of topography steep and rough heretofore eliminated;

(b) Six thousand eight hundred and ninety-seven acres permanently unproductive because of topography steep and rough; based on present land classification.

(2) \$119,606 on account of operation and maintenance deficit prior to reclamation extension Act of 1914.

(3) \$12,036 on account of error or mistake representing Johnson Creek lateral storage investigations and Nine Mile location surveys as shown on page 14 of House Document Numbered 201, Sixty-ninth Congress, first session.

SEC. 3. All payments upon construction charges shall be suspended against the following lands:

(a) Ten thousand five hundred acres temporarily unproductive for lack of fertility in the soil, seepage, and excessive alkali salts;

(b) Six thousand eight hundred and ninety-five acres, Willow Creek lands awaiting further developments, temporarily unproductive;

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 14 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

### BOISE PROJECT, IDAHO

SEC. 4. All payments upon construction charges shall be suspended against the following lands:

(a) Two thousand nine hundred and ninety acres, Arrowrock division, temporarily unproductive for lack of fertility in the soil and being water-logged;

(b) Four hundred and eight acres, Arrowrock division, Nampa and Meridian district, temporarily unproductive for lack of fertility in the soil, being water-logged;

(c) Two thousand six hundred and fifty acres, Arrowrock division, temporarily unproductive because of light, sandy soil that blows easily;

(d) Three hundred and eighty-eight acres, Arrowrock division, temporarily unproductive because of porous soil difficult to irrigate.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 15 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

### CARLSBAD PROJECT, NEW MEXICO

SEC. 5. There shall be deducted from the total cost of the said project the sum of \$374,885.69, on account of error and mistake in providing for additional storage in Lake McMillan reservoir as follows:

(1) Acquisition of flowage rights required for additional storage, rights of way, and expenses incidental thereto, \$164,383.62.

(2) For additional and incidental construction required for said additional storage, \$210,502.07, as follows:

(a) Preliminary surveys, and so forth, \$6,718.62.

(b) Extra dam construction, \$89,153.13.

(c) Holes in reservoir bottom, \$2,379.52.

(d) Spillway numbered 1, \$49,549.80.

(e) Spillway numbered 2, \$62,701.

SEC. 6. All payments upon construction charges shall be suspended against the following lands: One thousand and five acres temporarily unproductive for lack of fertility in the soil because of seepage and alkalinity; all as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 17 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

### GRAND VALLEY PROJECT, COLORADO

SEC. 7. There shall be deducted from the total cost of said project the following sums:

\$760,628, or such an amount as represents the construction costs as found by the Secretary of the Interior against the following lands:

(a) Nine thousand one hundred and seven acres permanently unproductive for lack of fertility in the soil, shallow soil, alkalinity, and unfavorable topography;

(b) One thousand six hundred and fifty acres, West End Extension, permanently unproductive because of unfavorable topography, shallow soil, and alkalinity.

SEC. 8. When construction charges are announced for the productive lands of the project all payments of construction charges shall be suspended against the following lands:

(a) Seven thousand one hundred and fifty acres temporarily unproductive for lack of fertility in the soil, seepage, and alkalinity;

(b) Eleven thousand eight hundred and sixty-three acres of productive lands temporarily unproductive because no construction thus far of the Garfield pump-

ing division, or of the Loma siphon land extension, or any other means of reclaiming the same, and there being no present demand for these unirrigated lands.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 19 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, said document.

### HUNTLEY PROJECT, MONTANA

SEC. 9. There shall be deducted from the total cost of said project the following sums:

(1) \$46,987, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four hundred and four acres, Pryor division, permanently unproductive because eroded and marginal to the river;

(b) Four hundred and twenty-seven acres, Eastern and Fly Creek divisions, permanently unproductive for lack of fertility in the soil.

(2) \$81,354 on account of operation and maintenance deficit prior to reclamation extension Act of 1914.

The Secretary is further directed to assume as a definite loss such sums as in his judgment may be just and proper in connection with moneys expended for experiments with reclamation on alkali lands, and costs in excess of contracted returns, such total not to exceed \$41,000.

SEC. 10. All payments upon construction charges shall be suspended against the following lands:

(a) Eleven thousand one hundred and seventy acres, Pryor division, temporarily unproductive, being gumbo and alkali soil;

(b) One thousand three hundred and thirty-six acres, Pryor division, temporarily unproductive, being private lands unplugged;

(c) Nine hundred and seventy acres, Eastern and Fly Creek divisions, temporarily unproductive, seeped.

All as shown by classification heretofore made under the supervision of the Board of Survey and adjustments and as shown in the table on page 21 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

### KING HILL PROJECT, IDAHO

SEC. 11. There shall be deducted from the total cost of said project the following sum:

(1) \$531,958, or such amounts as represent actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Seven hundred and ten acres permanently unproductive, being not susceptible of improvement because of lack of fertility in the soil;

(b) Three thousand seven hundred and sixty-four acres on account of inadequate

water supply, porous soil, and gravelly subsoil.

SEC. 12. All payments upon construction charges shall be suspended against the following lands:

(a) One thousand eight hundred and ninety-eight acres, on account of probably insufficient water supply, porous soil and sandy and porous subsoil;

(b) Five hundred and sixteen acres included in town sites and suspended areas.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 23 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

#### KLAMATH PROJECT, OREGON

SEC. 13. There shall be deducted from the total cost of said project the following sum:

(1) \$1,587, or such amounts as may be actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Thirty-eight acres main divisions, Klamath irrigation district, permanently unproductive for lack of fertility in the soil.

SEC. 14. All payments upon construction charges shall be suspended against the following lands:

(a) Five hundred and seventeen acres, main division, Klamath irrigation district, temporarily unproductive for lack of fertility in the soil;

(b) One hundred and twenty-nine acres, Horsefly irrigation district, temporarily unproductive for lack of fertility in the soil;

(c) Eighty-three acres, Langell Valley irrigation district temporarily unproductive for lack of fertility in the soil.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments, as shown in the table on page 27 of said Document 201, as checked and modified as recommended in "General recommendations" numbered 2 and 4, page 60, of said Document 201.

SEC. 15. The Secretary is further authorized and directed when announcement is made of the construction charges for the Tule Lake division of this project to take into consideration the recommendation of the board on page 26 of said Document 201, that a loss to the reclamation fund will ultimately ensue on this division and also a probable loss of \$34,000 from lands of the Horsefly irrigation district by reason of the construction of the Gerber Reservoir, and he is further authorized and directed to deduct from the cost of said division the sum of \$234,407 as recommended by the Board of Survey and Adjustments on page 26 of said document, and to fix and allocate the construction cost per acre in accordance with the findings and recommendations of the said board on page 26 of said document. The construction charge against the area in this division now under contract shall also be adjusted accordingly: *Provided*, That the construction charges shall in no event exceed a just and equitable charge against the Tule Lake division based on the value of water for irrigation under the economic conditions prevailing, notwithstanding such charges may not return the full cost of construction.

SEC. 16. Nothing in this Act shall be held to affect or prejudice the claims of the Klamath Irrigation District or the State of Oregon in any suit or action now or hereafter instituted to set aside that certain contract between the United States and the California-Oregon Power Company, dated February 24, 1917, together with all contracts or modifications thereof, and to set aside or cancel the sale made by the United States of the so-called Ankeny and Keno Canals and the lands embraced in the rights of way thereof in the year 1923 to the said California-Oregon Power Company.

#### LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

SEC. 17. There shall be deducted from the total cost of said project the following sum:

(1) \$382,254, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Five hundred and seventy-four acres permanently unproductive on account of right of way of the Great Northern Railway.

(b) Seven hundred and eighty-eight acres permanently unproductive, embracing town sites.

(c) Six thousand and seventy-seven acres on account of error in original estimate of irrigable area.

SEC. 18. All payments upon construction charges shall be suspended against the following lands:

(a) Five hundred acres temporarily unproductive because of damage by erosion;

(b) Two thousand eight hundred acres temporarily unproductive because water-logged;

(c) Seven thousand one hundred and eighty-eight acres temporarily unproductive because of forest covering and rough topography;

(d) Three hundred and thirteen acres temporarily unproductive because located in United States reserves.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 28 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

#### MILK RIVER PROJECT, MONTANA

SEC. 19. There shall be deducted from the total cost of said project the following sums:

(1) \$100,978, or such an amount as represents the construction costs as found by the Secretary of the Interior against the following lands:

(a) One thousand seven hundred and seventy acres permanently unproductive for lack of fertility in the soil.

(2) \$145,054 on account of error or mistake, representing unused Saint Mary East Canal and measuring Saint Mary waters as shown on page 31 of said Document 201.

(3) \$929,212, major work unused as shown on page 31 of said Document Numbered 201.

(4) \$735,945, major and minor works unused as shown on page 31 of said Document Numbered 201.

SEC. 20. When the construction charges are announced for the productive lands of the project all payments of construction charges shall be suspended against the following lands:

(a) Twenty-three thousand five hundred acres temporarily unproductive for lack of fertility in the soil;

(b) Nine thousand four hundred and thirty acres temporarily unproductive because of inadequate storage and refractory soils.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 31 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

#### MINIDOKA PROJECT, IDAHO

SEC. 21. There shall be deducted from the total cost of said project the following sum:

(1) \$9,172, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) One hundred and seventy-eight acres, Gravity division, permanently unproductive for lack of fertility in the soil;

(b) Thirty-eight acres, South Side Pumping division, permanently unproductive for lack of fertility in the soil and impregnated with alkali.

SEC. 22. All payments upon construction charges shall be suspended against the following lands:

(a) One thousand six hundred and thirty-four acres, Gravity division, temporarily unproductive because water-logged and for lack of fertility in the soil;

(b) Nine hundred and twenty acres, Gravity division, temporarily unproductive because of inadequate water supply and of porous soil;

(c) Five hundred and twenty-five acres, Gravity division, temporarily unproductive because of "blow soil";

(d) One hundred and ninety-seven acres, South Side Pumping division, temporarily unproductive for lack of fertility in the soil and because water-logged.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 33 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

#### NEWLANDS PROJECT, NEVADA

SEC. 23. There shall be deducted from the total cost of said project the following sums:

(1) \$3,315,136, or such amount as represents actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four hundred and four acres permanently unproductive for lack of fertility in the soil;

(b) Fifty thousand acres on account of inadequate water supply; major works unused;

(c) Thirty-two thousand five hundred and eighty-two acres on account of inadequate water supply; major and minor works unused.

(Continued on page 112)

# The Omnibus Bill as Passed and Approved by the President

(Continued from page 111)

(2) \$139,687 for operation and maintenance deficit prior to Reclamation Extension Act of 1914;

(3) \$82,221, Truckee River water-right adjudication;

(4) \$71,605 expense pumping at Lake Tahoe and Truckee Canals, less amount recovered from sale of power;

(5) \$155,465 on account of error or mistake covering various items due chiefly to lesser irrigable area than contemplated;

(6) \$884,998 on account of error or mistake, being aggregate shortage of returns because of low acre charges in the early contracts, allowing also for surcharge on nine hundred and thirty-four acres of land.

SEC. 24. All payments upon construction charges shall be suspended against the following lands:

(a) Four thousand four hundred and fourteen acres temporarily unproductive for lack of fertility in the soil;

(b) Ten thousand six hundred and ninety-four acres public and private lands uncontracted at present.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 37 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

## NORTH PLATTE PROJECT, NEBRASKA-WYOMING

SEC. 25. There shall be deducted from the total cost of said project the following sums:

### INTERSTATE DIVISION

(1) \$36,250, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Five hundred and thirty-two acres permanently unproductive for lack of fertility in the soil.

(2) \$23,751.59 on account of error or mistake in charging the cost of secondary investigations to this division.

### FORT LARAMIE DIVISION

(1) \$22,680 on account of error or mistake in charging the cost of secondary investigations to this division.

### NORTHPORT DIVISION

(1) \$3,425 on account of error or mistake in charging the cost of secondary investigations to this division.

SEC. 26. All payments upon construction charges shall be suspended against the following lands:

### INTERSTATE DIVISION

(a) Twenty-five thousand three hundred and ninety-nine acres temporarily unproductive for lack of fertility in the soil, being partly seeped and partly blow sand;

(b) Five hundred and fifteen acres temporarily unproductive, being unclassified land.

### FORT LARAMIE DIVISION

(a) Seven thousand six hundred and

sixty-five acres temporarily unproductive for lack of fertility in the soil.

### NORTHPORT DIVISION

(a) Two thousand five hundred and fifty-five acres temporarily unproductive for lack of fertility in the soil.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the tables on pages 39 and 40 of said Document 201, as revised and as checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

## OKANOGAN PROJECT, WASHINGTON

SEC. 27. There shall be deducted from the total cost of said project the following sums:

(1) \$227,783, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Two thousand three hundred and fifty-four acres permanently unproductive on account of sandy soil;

(b) Six acres, Duck Lake feeder canal right of way, permanently unproductive on account of other physical causes.

(2) \$492,917 on account of error or mistake in charging the cost of examination, surveys, construction, and purchase in connection with the following items: Colville extension, power plants numbered 1 and 2, Salmon Lake Reservoir, power plant numbered 3, transmission line, pumping plant at Riverside, and sandy land water rights.

SEC. 28. All payments upon construction charges shall be suspended against the following lands:

(a) Fifty-seven acres, temporarily unproductive because of sandy soil;

(b) Twenty-nine acres temporarily unproductive because of seepage.

SEC. 29. The sum of \$89,708.22, representing the total cost of works described below, shall be suspended and treated as a probable loss until the question of a permanent project water supply is settled, and if such works are then abandoned the Secretary of the Interior is authorized to deduct the sum named from the total cost of the project. The works are (1) Robinson Flat pumping plant, (2) Duck Lake pumping plant, (3) Salmon Lake pumping plant, (4) Government wells numbered 1 and 2, and (5) private wells and pumping plant.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments, as shown in the tables on page 42 of said Document 201, subject to checking and modification as recommended in "General recommendations" numbered 2 and 4, on page 60 of said document.

## RIO GRANDE PROJECT, NEW MEXICO-Texas

SEC. 30. There shall be deducted from the total cost of said project the following sum:

(a) \$31,661.35 on account of error or mistake in charging the costs of the fol-

lowing items against said project: Operation and maintenance deficit (El Paso County water improvement district numbered 1); Farm unit survey, Leasburg division (Elephant Butte irrigation district), 50 per centum of \$14,530; Palomas Valley, farm unit survey; Palomas Valley, canal survey; Palomas Valley, flood protection and drainage; Palomas Valley, percentage cost of general investigations charged; San Luis Valley, drainage investigations.

All as shown in the table on page 45 of said Document 201 as revised and subject to checking and modification as recommended in "General recommendations" on pages 60 and 61 of said document.

(b) The Secretary of the Interior is hereby authorized to credit on the contract dated January 17, 1920, as supplemented by contract of October 12, 1922, between the United States and the El Paso County Water Improvement District Number 1, the sum of \$350,000 or such portion thereof as in the opinion of the Secretary of the Interior may be necessary and is actually expended in the investigation and construction of necessary works to be built at the expense of said district as a part of the Rio Grande project for the protection of its water supply encroached upon by diversions made from the Rio Grande for use in Mexico. The amounts expended by said district shall be credited upon the said contracts of January 17, 1920, and October 12, 1922, between the United States and the district to the extent of construction charges payable annually by the district to the United States under the contracts mentioned, the first credit to be applied in the year in which the funds, or a portion thereof, within above limitation, are expended. Thereafter such credits shall continue until all cost so incurred by the district shall have been absorbed. During the years credits are so applied no payments shall be required on the part of said district under its contracts mentioned. The total indebtedness under said contracts shall be reduced to the extent of expenditures made hereunder.

## SHOSHONE PROJECT, WYOMING-MONTANA

SEC. 31. There shall be deducted from the total cost of said project the following sums:

(1) \$1,677,630, or such amount as represents actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four thousand and eleven acres, Garland division, permanently unproductive for lack of fertility in the soil;

(b) Eighteen thousand three hundred and twenty-four acres, Frannie division, permanently unproductive for lack of fertility in the soil.

(2) (a) \$21,373 on account of operation and maintenance deficit prior to reclamation extension Act of 1914 (Garland division).

(b) \$16,663 on account of operation and maintenance deficit prior to reclamation extension Act of 1914 (Frannie division).



SEC. 32. All payments upon construction charges shall be suspended against the following lands:

(a) Three thousand seven hundred and nine acres, Garland division, temporarily unproductive for lack of fertility in the soil;

(b) Three thousand three hundred and fifty-three acres, Frannie division, temporarily unproductive for lack of fertility in the soil.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 47 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

(c) Five hundred and twenty-four acres on account of having been abandoned.

#### SUN RIVER PROJECT, MONTANA

SEC. 33. There shall be deducted from the total cost of said project the following sums:

(1) \$79,649, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Nine hundred and sixty-two acres, Fort Shaw division, permanently unproductive for lack of fertility in the soil, nonirrigable and nonarable;

(b) One hundred and five acres, Fort Shaw division, permanently unproductive because inaccessible by erosion and floods;

(c) One thousand two hundred and thirty-three acres, Fort Shaw division, permanently unproductive because flooded and eroded.

(2) \$11,734 because of error or mistake on account of adjustment losses.

(3) \$34,148, Operation and Maintenance deficit prior to the Reclamation Extension Act of 1914.

SEC. 34. All payments upon construction charges shall be suspended against the following lands:

(a) Two thousand five hundred and eighteen acres, Fort Shaw division, temporarily unproductive, subscribed; water-logged;

(b) One thousand two hundred and ninety-two acres, Fort Shaw division, temporarily unproductive, unentered, and unsubscribed.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 49 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

#### UMATILLA PROJECT, OREGON

SEC. 35. There shall be deducted from the total cost of said project the following sums:

##### EAST DIVISION

(1) \$490,390, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Two thousand five hundred and seventy-five acres permanently unproductive for lack of fertility in the soil, not susceptible of improvement;

(b) Two thousand two hundred and fifty-five acres permanently unproductive because of porous soil, gravelly subsoil.

(2) \$388,448 on account of error or mistake—excluded from district repayments on account of faulty construction.

(3) \$16,711 on account of error or mistake; loss on Hermiston district lands.

(4) \$91,083 on account of operation and maintenance deficit prior to Reclamation Extension Act of 1914.

##### WEST DIVISION

(1) \$5,703, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Fifty-nine acres permanently unproductive for lack of fertility in the soil, not susceptible of improvement.

(2) \$252 on account of error or mistake representing shortage of contracted returns from fifty-four acres under water-right applications.

(3) The water-rights formerly appurtenant to all permanently unproductive lands on the Umatilla project shall be available to the remaining lands without added cost to the water users.

SEC. 36. All payments upon construction charges shall be suspended against the following lands:

##### EAST DIVISION

(a) Six hundred and ten acres temporarily unproductive for lack of fertility in the soil because of water-logging;

(b) Five hundred and thirty acres representing in amount \$37,100 and described as probable loss on Hermiston district lands.

##### WEST DIVISION

(a) Three thousand four hundred and twenty-two acres temporarily unproductive because of inadequate water supply;

(b) Five hundred and ninety-five acres temporarily unproductive because of water-logging.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments, as shown in the tables on page 52 of said Document 201, as revised and as checked and modified as recommended in "General recommendations" numbered 2 and 4, on page 60 of said document.

#### UNCOMPAHGRE PROJECT, COLORADO

SEC. 37. There shall be deducted from the total cost of the said project the following sums:

(1) \$1,318,056, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four hundred and thirty-nine acres permanently unproductive for lack of fertility in the soil;

(b) Twenty-four thousand nine hundred and eighteen acres permanently unproductive because of an inadequate water supply.

(2) \$47,371 on account of error or mistake representing deductions recommended and covered in contract of May 7, 1918, between the United States and the Uncompahgre Valley Water Users' Association. The total thus to be deducted from the project cost shall be charged off as a permanent loss to the reclamation fund.

SEC. 38. All payments upon construction charges shall be suspended against the following lands:

(a) Seventeen thousand acres temporarily unproductive because water-logged;

(b) Five thousand six hundred and twenty-nine acres temporarily unproductive because of rolling and uneven topography;

(c) Five thousand acres temporarily unproductive because of alkalinity;

(d) The water rights formerly appurtenant to the permanently unproductive lands shall be available to the remaining land on said project without added cost to the water users, because of the Gunnison Tunnel not yet being completed and there being an inadequate water supply.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 55 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

#### YAKIMA PROJECT, WASHINGTON

SEC. 39. There shall be deducted from the total cost of said project the following sum:

\$3,068, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

Fifty-nine acres, Sunnyside division, permanently unproductive because of shallow soil overlying rock.

SEC. 40. All payments upon construction charges shall be suspended against the following lands:

(a) One thousand eight hundred and forty-nine acres, Sunnyside division, temporarily unproductive, being either water-logged, alkali, rough, steep, shallow soil overlying hardpan, or difficult to subdue.

(b) Three thousand and thirty-two acres, Tieton division, temporarily unproductive because of shallow, poor soil with rough topography.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown on page 57 of said document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

#### ADMINISTRATIVE PROVISIONS

SEC. 41. All lands found by the classification to be permanently unproductive shall be excluded from the project and no water shall be delivered to them after the date of such exclusion unless and until they are restored to the project. Except as herein otherwise provided, the water right formerly appurtenant to such permanently unproductive lands shall be disposed of by the United States under the reclamation law: *Provided*, That the water users on the projects shall have a preference right to the use of the water: *And provided further*, That any surplus water temporarily available may be furnished upon a rental basis for use on lands excluded from the project under this section, on terms and conditions to be approved by the Secretary of the Interior.

SEC. 42. The construction charges heretofore paid on permanently unproductive lands excluded from the project shall be applied as a credit on charges due or

(Continued on page 114)

## The Omnibus Bill as Passed and Approved by the President

(Continued from page 113)

to become due on any remaining irrigable land covered by the same water-right contract or land taken in exchange as provided in section 44 of this Act. If the charges so paid exceed the amount of all water-right charges due and unpaid, plus the construction charges not yet due the balance shall be paid in cash to the holder of the water-right contract covering the land so excluded or to the irrigation district affected; which in turn shall be charged with the responsibility of making suitable adjustment with the landowners involved. Should all the irrigable lands of a water-right applicant be excluded from the project as permanently unproductive, and no exchange be made as provided in section 44 hereof, the total construction charges heretofore paid, less any accrued charges on account of operation and maintenance, shall be refunded in cash, the water-right contract shall be canceled, and all liens on account of water-right charges shall be released.

SEC. 43. The payment of all construction charges against said areas temporarily unproductive shall remain suspended until the Secretary of the Interior shall declare them to be possessed of sufficient productive power properly to be placed in a paying class, whereupon payment of construction charges against such areas shall be resumed or shall begin as the case may be. While said lands are so classified as temporarily unproductive and the construction charges against them are suspended, water for irrigation purposes may be furnished upon payment of the usual operation and maintenance charges, or such other charges as may be fixed by the Secretary of the Interior the advance payment of which may be required, in the discretion of the said Secretary. Should said lands temporarily classed as unproductive, or any of them, in the future be found by the Secretary of the Interior to be permanently unproductive, the charges against them shall be charged off as a permanent loss to the reclamation fund and they shall thereupon be treated in the same manner as other permanently unproductive lands as provided in this Act.

SEC. 44. Settlers who have unpatented entries under any of the public land laws embracing lands which have been eliminated from the project, or whose entries under water rights have been so reduced that the remaining area is insufficient to support a family, shall be entitled to exchange their entries for other public lands within the same project or any other existing Federal reclamation project, with credit under the homestead laws for residence, improvement, and cultivation made or performed by them upon their original entries and with credit upon the new entry for any construction charges paid upon or in connection with the original entry: *Provided*, That when satisfactory final proof has been made on the original entry it shall not be necessary to submit final proof upon the lieu entry. Any entryman whose entry or farm unit is reduced by the elimination of permanently unproductive land shall be entitled to enter an equal amount of available public land on the same project contiguous to or in the vicinity of the farm unit reduced by elimination, with all credits in

this section hereinbefore specified in lieu of the lands eliminated. Owners of private lands so eliminated from the project may, subject to the approval of the Secretary of the Interior, and free from all encumbrances, relinquish and convey to the United States lands so owned and held by them, not exceeding an area of one hundred and sixty acres, and select an equal area of vacant public land within the irrigable area of the same or any other Federal reclamation project, with credit upon the construction costs of the lands selected to the extent and in the amount paid upon or in connection with their relinquished lands, and the Secretary of the Interior is hereby authorized to revise and consolidate farm units, so far as this may be made necessary or advisable, with a view to carrying out the provisions of this section: *Provided further*, That the rights extended under this section shall not be assignable: *And provided further*, That in administering the provisions of this section and section 42, the Secretary of the Interior shall take into consideration the rights and interests of lien holders as to him may seem just and equitable: *Provided further*, That where two entrymen apply for the same farm unit under the exchange provisions of this section, only one of whom is an ex-service man, as defined by the joint resolution of January 21, 1922 (Forty-second Statutes, page 358), the ex-service man shall have a preference in making such exchange.

SEC. 45. The Secretary of the Interior is hereby authorized, in his discretion, to amend any existing water-right contract to the extent necessary to carry out the provisions of this Act, upon request of the holder of such contract. The Secretary of the Interior, as a condition precedent to the amendment of any existing water-right contract, shall require the execution of a contract by a water-users' association or irrigation district whereby such association or irrigation district shall be required to pay to the United States, without regard to default in the payment of charges against any individual farm unit or tract of irrigable land, the entire charges against all productive lands remaining in the project after the permanently unproductive lands shall have been eliminated and the charges against temporarily unproductive areas shall have been suspended in the manner and to the extent authorized and directed by this Act.

The Secretary is authorized, in his discretion, upon request of individual water users or districts, and upon performance of the condition precedent above set forth, to amend any existing water-right contract to provide for increase in the time for payment of construction charges, which have not then accrued, to the extent that may be necessary under the conditions in each case, subject to the limitation that there shall be allowed for repayment not more than forty years from the date the first payment matured under the original contract, and also to extend the time for payment of operation and maintenance or water rental charges due and unpaid for such period as in his judgment may be necessary not exceeding five years, the charges so extended to bear interest payable annually at the rate of 6 per centum

per annum until paid, and to contract for the payment of the construction charges then due and unpaid within such term of years as the Secretary may find to be necessary, with interest payable annually at the rate of 6 per centum per annum until paid.

The Secretary is further authorized, in his discretion, to grant the relief provided for in section 4, Act of December 5, 1924 (Forty-third Statutes at Large, page 701), to any of the projects mentioned in this Act, without requiring such project to take over the care, operation, and maintenance of the project works.

The decision of the Secretary as to the necessity for amending any such contract shall be conclusive: *Provided*, That nothing in this Act shall prevent the execution of any contract heretofore negotiated or in connection with which negotiations have been heretofore opened in good faith or which may be hereafter opened in good faith under the Act approved December 5, 1924 (Forty-third Statutes at Large, page 701), and which shall be executed on or before January 1, 1927, unless the water users affected elect to have the contract governed by this section: *Provided further*, That in the execution of any contract provided for in the last proviso, the Secretary of the Interior shall have authority to arrange for payment of construction charges by any project or division for the calendar years 1926, 1927, and 1928 in proportion to the state of development of the project in those years: *Provided further*, That the Secretary of the Interior is authorized to complete and execute the supplemental contract, now being negotiated and which has been approved as to form by the Secretary, between the United States and the Belle Fourche Irrigation District and at the expiration of said supplemental contract to enter into a permanent contract on behalf of the United States with said District in accordance with the terms of said supplemental contract.

SEC. 46. No water shall be delivered upon the completion of any new project or new division of a project until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or irrigation districts organized under State law providing for payment by the district or districts of the cost of constructing, operating, and maintaining the works during the time they are in control of the United States, such cost of constructing to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than forty years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Prior to or in connection with the settlement and development of each of these projects, the Secretary of the Interior is authorized in his discretion to enter into agreement with the proper authorities of the State or States wherein said projects or divisions are located whereby such State or States shall cooperate with the United States in promoting the settlement of the projects or divisions after completion and in the securing and selecting of settlers. Such contract or contracts with irrigation districts herein-

before referred to shall further provide that all irrigable land held in private ownership by any one owner in excess of one hundred and sixty irrigable acres shall be appraised in a manner to be prescribed by the Secretary of the Interior and the sale prices thereof fixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from any project or division if the owners thereof shall refuse to execute valid recordable contracts for the sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior; and that until one-half the construction charges against said lands shall have been fully paid no sale of any such lands shall carry the right to receive water unless and until the purchase price involved in such sale is approved by the Secretary of the Interior and that upon proof of fraudulent representation as to the true consideration involved in such sales the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sales: *Provided further*, That the operation and maintenance charges on account of lands in said projects and divisions shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available, and the operation and maintenance charges payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment.

Sec. 47. Subsections E, F, and L of section 4, Act approved December 5, 1924 (Forty-third Statutes at Large, page 701), are hereby repealed, except as herein otherwise provided.

Sec. 48. The purpose of this Act is the rehabilitation of the several reclamation

Project	As recommended by Board of Survey and Adjustments			As authorized by act of May 25, 1926 (H. R. 10429)		
	Amount of loss			Amount of loss		
	Definite	Probable	Total	Definite	Probable	Total
Belle Fourche.....	\$544,521	\$734,618	\$1,279,139	\$487,451	\$734,618	\$1,222,069
Boise.....		495,369	495,369		495,369	495,369
Carlsbad.....		45,867	45,867		45,867	420,753
Grand Valley.....	760,628	1,344,409	2,105,037	760,628	1,344,409	2,105,037
Huntley.....	168,981	719,642	888,623	168,981	719,642	888,623
King Hill.....	531,958	287,024	818,982	531,958	287,024	818,982
Klamath.....	170,684	62,711	233,395	1,587	62,711	64,298
Lower Yellowstone.....	382,254	607,017	989,271	382,254	607,017	989,271
Milk River.....	1,946,189	1,878,656	3,824,845	1,911,189	1,878,656	3,789,845
Minidoka.....	9,172	132,787	141,959	9,172	132,787	141,959
Newlands.....	4,536,396	813,264	5,349,660	4,649,112	813,264	5,462,376
North Platte.....	237,877	2,599,987	2,837,864	86,107	2,599,987	2,686,094
Okanogan.....	720,700	99,473	820,173	720,700	99,473	820,173
Rio Grande.....	43,158		43,158	381,661		381,661
Shoshone.....	1,715,666	534,006	2,249,672	1,715,666	534,006	2,249,672
Sun River.....	125,531	131,940	257,471	125,531	131,940	257,471
Umatilla.....	992,587	487,357	1,479,944	992,587	487,357	1,479,944
Uncompahgre.....	1,365,427	1,436,155	2,801,582	1,365,427	1,436,155	2,801,582
Yakima.....	3,068	378,124	381,192	3,068	378,124	381,192
Total.....	14,254,797	12,788,408	27,043,203	14,667,965	12,788,406	27,456,371

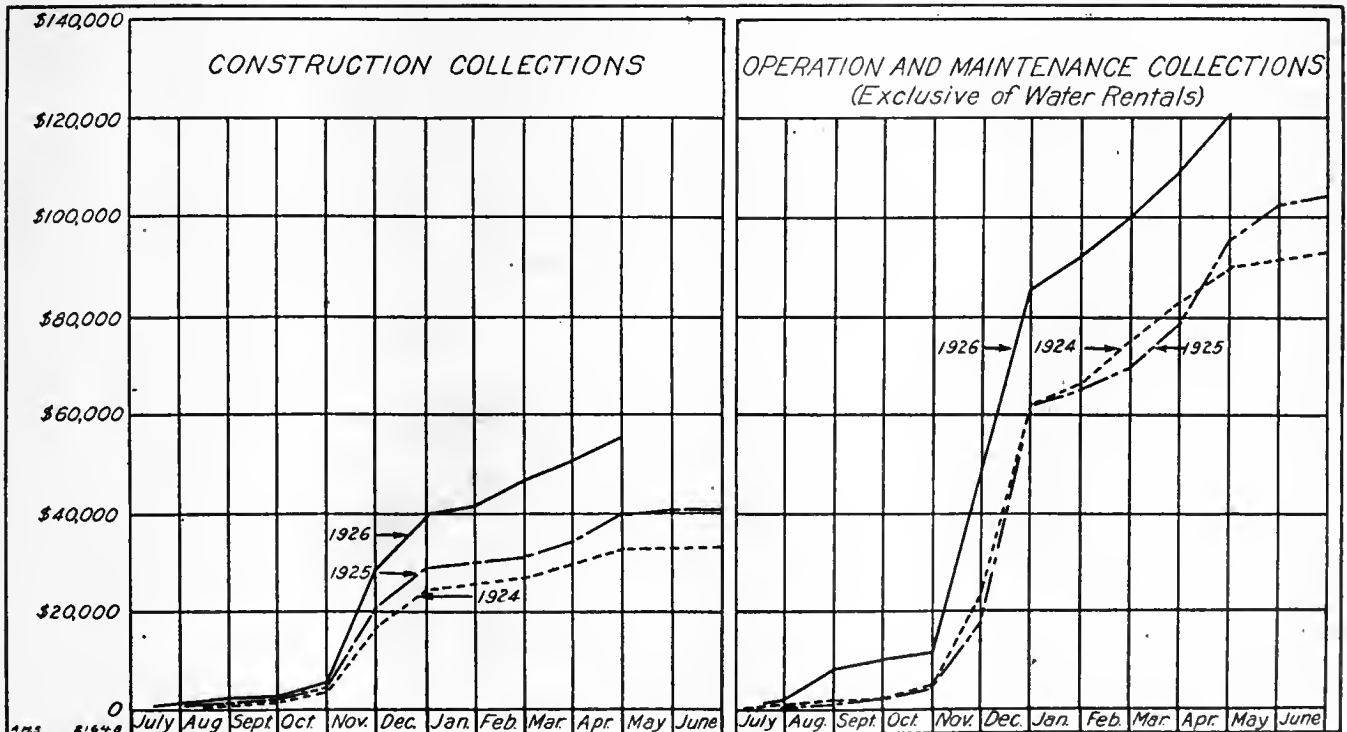
projects and the insuring of their future success by placing them upon a sound operative and business basis, and the Secretary of the Interior is directed to administer this Act to those ends.

Sec. 49. Pending the execution of any contract under this Act, or the Interior Department Appropriation Act for the fiscal year 1927, or the said Act of December 5, 1924, the Secretary is authorized, in his discretion and when convinced that action looking to execution of contract is being expedited in good faith, to deliver water during the irrigation season of 1926 to the irrigation district, water users' association, or water-right applicant affected, notwithstanding delinquency in the payment of water-right charges which under the law applicable would render such irrigation district,

water users' association, or water-right applicant ineligible to receive water.

Sec. 50. The adjustments under sections 1 to 40, inclusive, of this Act are declared to be an incident of the operation of the "reclamation law," a final adjudication on the projects and divisions named in such sections under the authority contained in subsection K, section 4, of the Act approved December 5, 1924 (Forty-third Statutes, page 701), and shall not hereafter be construed to be the basis of reimbursement to the "reclamation fund" from the general fund of the Treasury or by the diversion to the "reclamation fund" of revenue of the United States not now required by law to be credited to such "reclamation fund."

Approved, May 25, 1926. (Public No. 284.)



The Newlands project gets in the "Blue Ribbon" class

## Project Women and Their Influence in the Home and on Farm Life

*Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community*

*By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era*



Mother's little helpers

**T**HE single man is adverse to tackling a project farm alone. The married men are in the majority. This is brought out by a review of the applications received under the new system of selecting settlers.

Farm work is hard at its best and the woman in the home is the stimulating influence. It is she who creates the comfortable farm home and looks after the health of the family, making possible the successful farm.

Family "assets" are mother's and father's little helpers, the growing boys and girls on the projects.

Experts are continually lending their time and efforts to evolve methods to lighten housework in the rural districts. Modern conveniences, taken for granted in the city, and which save the city housewife so much time, are lacking on many of our projects. A large percentage of farm homes even lack plumbing entirely. Necessity often creates inventive ability, but then the means are not always at hand. However, such things as kitchen improvement and rearrangement, installation of water, sewage disposal, light and heating systems are some of the simple changes that can be made without any great outlay of funds.

### Lighting Artistically

Glare in lighting should always be guarded against. The light should be of sufficient intensity to prevent eyestrain. Beauty and color may be added to a room by the use of shades. This is an opportunity for an expression of individuality on the part of the project woman. The simplest shades may be made economically with some wire and a piece of silk. Choose a cheerful color and you will be rewarded by the effect. Even the furnishings of a room take on a different appearance under such a light.

### The Project Girl

Have you ever thought what place you hold in the big task undertaken by your parents in making a home upon the land?

I know you have often wondered how mother does so much in one day. We all go through that stage but we often leave it at that and do not try to figure out how we can help, thus giving mother a pleasure and a rest at the same time. Isn't it worth the effort to see her face

light up in agreeable surprise with a word of praise on her lips when you have done some little thoughtful thing that she must otherwise do herself in the course of the day?

Probably mother is going to have some neighbors in for dinner. This is where you can help. Mother is busy cooking the meal. You set the table. The success of the meal might depend on just how you do this, and at any rate its appearance will be one of the things that will stay in the minds of her guests as they depart. Therefore let us do it well.

A well laid table requires that it be first covered with a silence cloth, a regular table pad, heavy cotton flannel or its equivalent. The tablecloth should be large enough to fall from the edge of the table from 9 to 12 inches.

Guests should be seated to allow freedom of movement; about 2 feet from plate center to plate center is ideal.

The silver is placed so that the ends of the knife and fork are one inch from the edge of the table. The knife is placed at the right with the sharp edge toward the plate; the fork at the left with prongs turned up. The other silverware is placed parallel to these, and placed so that the piece to be used first is farthest from the plate and the others in regular order knives and spoons being on the right and forks on the left, with the exception of the oyster fork (if one is used) which is placed at the extreme right.

The glass is placed at the tip of the knife.

Bread and butter or salad plates are placed at the tip of the fork and a trifle to the left.

The napkin is placed at the left of the forks or on the plate.

Your centerpiece may be a bowl or low vase of fresh-cut flowers from Mother's garden.

### Project Women are Versatile

Many of our projects being some distance from towns and cities places on the project woman the necessity of clothing her family by the skill of her own hands.

Lots of times a dress for "sister" or mother is spoiled by selecting the wrong color. Colors should be selected to suit the various types.

The family budget makes it necessary, however, to consider cost and although



## Women on the Projects and Their Relation to Better Agriculture

*The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life*

becomingness is the desired effect of the wearer, durability is a factor not to be lost track of.

When the housewife purchases fabric for a garment she usually takes the word of the saleslady behind the counter as to the quality and service of her selections.

A little time would be wisely spent in a study of the fiber, weave, finish, and dyeing. The fiber might be examined by drawing out a strand here and there, and the weave finish and dyeing by studying both the upper and under sides.

### The Vegetable Garden

This and the flower garden are the pride of the housewife; both serve the home.

The enterprising woman often finds a market for vegetables she raises over and above the needs of her family, both immediate and what may be preserved for use until next year's garden produces more.

A properly worked vegetable garden helps both financially and physically all members of the farmer's family. It supplies his table, which saves expenditure of funds, it supplies good healthful food, and last but not least, gives healthful exercise in the sun and fresh air that might not otherwise be undertaken and enjoyed by the housewife.

### Try These

#### OKRA SALAD

2 dozen okra pods. 1 green pepper.  
1 head of lettuce. 1 small onion.

Boil pods of okra in salted water until they are tender, drain and drop them in cold water to chill for half an hour. Drain them dry and put them on lettuce leaves. Chop green pepper and onion fine, separately. Sprinkle over lettuce and okra and add a boiled salad dressing as follows:

#### MAYONNAISE DRESSING

1 egg. ½ cupful of vinegar.  
1 teaspoonful dry mustard. 1 lump of butter (size of a walnut).

Beat egg with a good pinch of salt and 3 teaspoonfuls of sugar (even). Mix well dissolving lumps, add half cupful of vinegar. Cook this until it thickens and add lump of butter, size of walnut. Let this chill before it is spread on any salad.

Mrs. Joseph B. Perkins, Fruita, Colo. (Grand Valley project), offers the two following recipes for trial by our project women:

#### RICE CREOLE

1½ cupfuls of rice. 1 small onion.  
2 cupfuls tomatoes. 6 slices lean bacon (or sausage).

Into a well-greased dish put a layer of cold cooked rice (about 1½ cupfuls), add tomatoes fixed as follows: 2 cupfuls of tomatoes, 1 tablespoon finely minced onion,



One of the larger vegetable gardens. Plenty to eat for the family and a reserve

1 tablespoon of bacon fryings and salt to taste. Cook till onion is done. Pour over rice without stirring and place over top six slices lean bacon (or sausage) and cook in hot oven till bacon is well browned.

#### COCONUT PUDDING

1 cupful brown sugar. butter (size of walnut).  
3½ tablespoonfuls flour. 1 cupful shredded coconut.  
2 eggs.

Take 1 cup of dark brown sugar and 3½ tablespoonfuls flour. Mix well and add yolks of two well-beaten eggs, piece of butter size of a walnut. Stir very thoroughly and add 1 pint boiling water. Cook till thick, remove from fire and add 1 cupful of coconut and cover with meringue made from whites of eggs. Brown in oven and serve cold.

### Household Hints

Use granulated sugar in the rinsing water when washing laces instead of starching them. The result will be more satisfactory.

If you want to improve the taste of your coffee made in a percolator sprinkle a tiny pinch of salt over your ground coffee before it cooks.

Have you a horsehair or a straw hat that has either lost its shape or some of its color? With a strong sugar water brush the hat on both sides with the weave. This will clean and bring out the color. Then set in sun to dry, making sure to shape it as it dries and stiffens.

### Solid Comfort

After the work of the day in the fields is over, the farmer comes into his home and knows a tempting meal awaits him there.

Add to this comfort a cozy corner. The requisites are only a deep-seated chair by the window and a lamp. Here he may smoke or read, getting enjoyment and the much-needed rest until he retires for the evening. Here he may enjoy the daylight while it lasts, and the window chosen should take into account the view from it.

What farmer does not like to view his garden or his fields in such a leisurely, comfortable manner?

Relaxation after a hard day's work acts as a tonic to the human system. Lots of times it is necessary to educate people on how to relax. Unknowingly total relaxation is not always taken after strenuous exercise; the nerves and the system retain some of the tenseness of the body and in this state we do not receive the maximum benefit of resting, even if we go through all the actions of seeking relaxation.

A complete change of thought is often desirable for refreshing of the mind. This relieves mental strain and puts one in a better position to relax the muscles of the body.



## Supplying Water to Delinquents

### Instructions to Superintendents

**SECTION 6** of the reclamation extension act prohibits the delivery of water to applicants who are delinquent in the payment of water-right charges for more than one calendar year.

Section 49 of H. R. 10429 reads as follows:

Pending the execution of any contract under this act, or the Interior Department appropriation act for the fiscal year 1927, or the said act of December 5, 1924, the Secretary is authorized, in his discretion and when convinced that action looking to execution of contract is being expedited in good faith, to deliver water during the irrigation season of 1926 to the irrigation district, water-users' association, or water-right applicant affected, notwithstanding delinquency in the payment of water-right charges which under the law applicable would render such irrigation district, water users' association, or water-right applicant ineligible to receive water.

This section gives the Secretary authority to deliver water under the conditions stated but does not require that water be delivered to all applicants.

On projects where contracts are pending

a large number of water users have paid certain delinquent charges in order that water service may not be withheld because of the provisions of section 6 of the reclamation extension act.

Others having an equal financial ability have not paid expecting all charges due and unpaid to be funded under new contracts to be executed. Justice to those who have paid demands that others equally able to make payments shall be required to do so.

With a view to the attainment of equality so far as possible directions are given that water be delivered under the following conditions:

(a) The present payment of delinquent charges against classes 5 and 6 land shall not be required as a prerequisite to water service.

(b) Water for the irrigation of land in classes 1 to 4 shall be delivered on the payment of one year's charges, those for 1924 to be paid unless some other year is fixed by special agreement approved by the commissioner. Payment shall

be made in cash or by the acceptance of promissory notes with crop mortgages under the conditions outlined in circular letter 1531.

(c) In cases where in the opinion of the superintendent it will not be possible for the resident water user to make cash payment, or execute notes with crop mortgages without rendering it impossible for him to carry on his farming operations and support his family, water may be delivered notwithstanding the delinquency, provided the user gives his unsecured personal note payable January first, 1927.

The right is reserved to exact payment under such terms as may be justified after full investigation if ability to pay shall be disclosed.

Instructions regarding accounting and other details involved will be issued at an early date.

ELWOOD MEAD,  
*Commissioner.*

Approved: May 22, 1926.

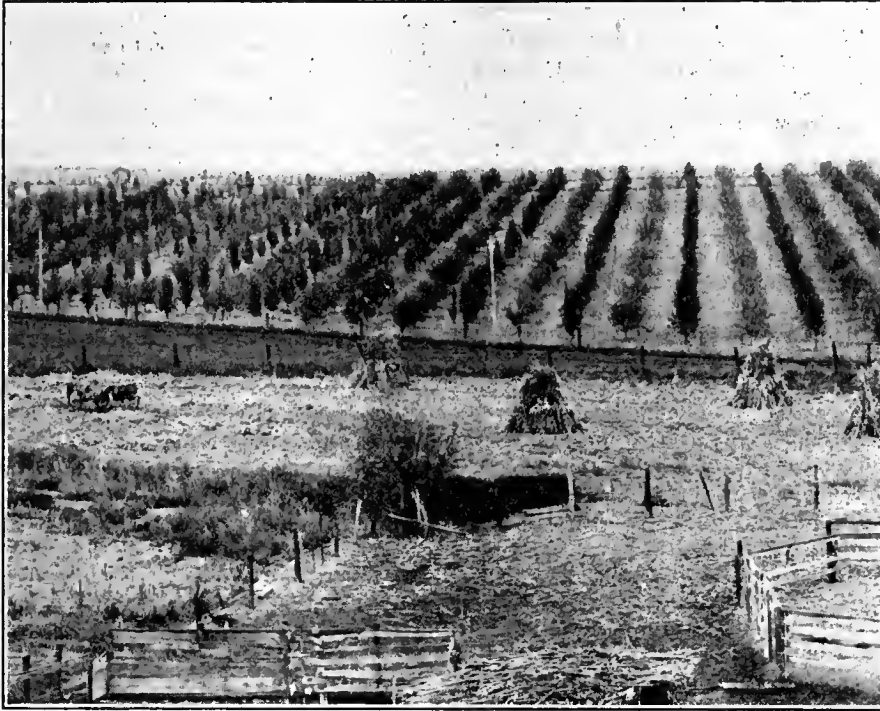
HUBERT WORK,  
*Secretary.*

So far as production is concerned a cow needs no more exercise than she will get by walking at will about a small yard.



This is one of the portable beet dumps used on the Milk River project, Mont. A small gasoline engine operates the machine

## Costs of Fruit Raising on the Yakima Project, Washington



One of the famous apple orchards on the Yakima project, Wash.

**M**R. L. J. GOODRICH, a retired banker of Toppenish, Wash., owns and operates 54 acres of orchard land on the Sunnyside division of the Yakima irrigation project, near Zillah, Wash. It is located immediately above the main Sunnyside Canal and is supplied with water by two 5-inch centrifugal pumps, operating against 45 feet and 70 feet respectively.

The pumping cost for 1925, including power and repairs but not plant depreciation, was \$668.25, or \$12.37½ per acre.

Mr. Goodrich keeps very careful detail costs of all operation connected with his land, and the attached tabulation gives the itemized cost for producing apples, pears, peaches, prunes, crabs, and grapes.

Twenty-eight acres of the tract were set out in 1908, 5 acres in 1919, and 14 acres in 1922, the remainder being devoted to alfalfa, grapes, garden, buildings, and corrals.

This orchard has a marked variety of fruit. Apples of the following varieties and proportions are grown: Winesaps, 40 per cent; Rome Beauty, 28 per cent; Staymens, 12 per cent, and New Towns, 15 per cent. Fifty-four per cent of the crop and 64 per cent of the proceeds are realized from the Winesaps. His bearing

pear trees are Bartletts. The Winter Nellis are just coming to bearing. There are also Italian prunes and Elberta peaches.

A manager and two men are employed steadily throughout the year. Quarters for these employees are provided and in addition to their salaries they receive

## Minidoka Project Homes Enjoy Electrical Aids

Approximately half the 2,500 farm homes on the Minidoka irrigation project in southern Idaho are supplied with electric energy which cheaply and efficiently aids the farmer and his wife in their daily tasks, according to a recent statement issued by the Department of the Interior.

In summer the greater part of the energy produced in the project power plants operated by the Bureau of Reclamation is used in pumping water for irrigation, but the project commercial and domestic load is also handled. In the winter a large amount of surplus power is used for heating.

The uses of electricity on the project farms are many and various. The most general use is for lighting. The majority of the housewives use electric flatirons and washing machines. Many also use electric hot plates, grilles, toasters, waffle irons, percolators, curling irons, warming pads, ranges, churns, sewing machines, and house fans.

The men naturally are more interested in electric motors for feed grinding, ensilage cutting, turning the grindstone and the circular saw, operating grain fans and blacksmith blowers, running cream separators, and heating incubators and brooders, all of which uses are found on the project.

garden, fruit, and dairy products for their families. The present manager has been in charge for 14 years. A daily work report is kept by the manager and all expenditures are by check. From these data Mr. Goodrich is enabled to keep the very detailed and accurate costs of the operations of the tract.

Cost of Raising Various Kinds of Fruit, 1925, Yakima Project

	Apples (430 boxes per acre)		Pears (15 tons per acre)		Peaches (425 boxes per acre)		Prunes (600 boxes per acre)		Crabs (630 boxes per acre)		Grapes (3,000 baskets per acre)	
	Acre	Box	Acre	Ton	Acre	Box	Acre	Box	Acre	Box	Acre	Basket
Overhead.....	\$13.79	\$0.032	\$13.79	\$0.92	\$9.76	\$0.029	\$11.35	\$0.019	\$11.35	\$0.018	\$9.77	\$0.004
Maintenance, labor...	84.25	.194	48.44	3.23	30.02	.09	31.33	.052	48.61	.08	57.76	.019
Maintenance, material	54.63	.127	33.88	2.26	20.38	.059	21.40	.036	31.83	.047	18.55	.006
Cost of raising.....	152.67	.353	96.11	6.41	60.76	.178	64.08	.107	91.79	.145	86.10	.029
Harvesting, labor.....	123.11	.287	77.42	5.16	33.95	.099	30.83	.051	116.13	.184	250.20	.086
Harvesting, material...	91.44	.213	0	0	22.79	.067	57.20	.07	101.42	.162	152.50	.051
Cost of harvesting....	214.55	.50	77.42	5.16	56.74	.166	88.03	.121	217.55	.346	411.70	.137
	367.22	.853	173.53	11.57	117.50	.344	152.11	.228	309.34	.491	497.80	.166
Receipts.....	(1)	(1)	843.92	56.26	280.13	.82	318.00	.53	498.48	.791	805.09	.268
Profits.....	(1)	(1)	670.39	44.69	162.63	.476	165.89	.277	189.14	.30	307.29	.102
Depreciation and interest on land.....	58.86	.137	58.75	3.93	46.85	.137	52.76	.088	52.76	.016	46.84	.016
Net profit.....	(1)	(1)	611.64	40.76	115.78	.339	113.13	.189	136.38	.216	260.45	.086

<sup>1</sup> Returns for apples not in.

## Hydroelectric Power Development on The Projects

THE construction of dams to store and divert water for irrigation has afforded an opportunity for the development of hydroelectric power as an incident to irrigation. This power development has lessened construction and operation costs and materially improved the condition of farmers on these projects. The opportunity to generate this power, which would not have paid private enterprise to develop independent of irrigation, arose through the building of these works for reclamation. Only through this could the benefits have been realized.

The total investment in 13 Federal reclamation power works is \$6,077,649. Their gross earnings for 1925 were \$1,067,135. Net earnings were \$442,619, or about 7 per cent on the total investment. This satisfactory financial showing is, however, the least part of the benefit. The chief gain has come from having this cheap power to operate pumping plants to furnish irrigation water; to use as motive power for drag-line excavators, both in building and cleaning out canals and drains. In some cases these power plants have paid for themselves in the lowering of construction costs.

Cheap power has put electric lights in the homes of people living on the Minidoka, Shoshone, North Platte, and other projects. Owning the plants enabled power to be furnished at a price the settler

could afford to pay. If settlers had been compelled to pay the rates which a private power plant would have had to charge, the farmers' wives would now be using gasoline and kerosene.

It has helped to develop local industries on projects like Shoshone and Minidoka, and as the projects become more completely and closely settled and the farms are better improved and more productive, the need for power in farming operations and for lighting homes will increase. This will bring increased revenue from these power plants. Yuma is an illustration of the better result to come. It cost \$320,000, which is included in the \$6,000,000 investment, but the net yearly revenue, estimated to be \$50,000, will only begin to be received after July 1, 1926.

If it were not for the power revenues of the Guernsey Reservoir, the charges to be paid by irrigators for the stored water would have to be doubled, and this would be a burden they could not carry. The feasibility of this development depended on the revenue from power which it would make possible.

With the increased cost of irrigation works in the future, the revenues from power must be depended upon to lessen the burden on the irrigator. It will make projects feasible that could otherwise be built only at a financial loss to the Government.

## SNAKE RIVER WATER-RIGHT CONTROVERSIES SETTLED

A contract which will probably have a far-reaching effect upon controversies over Snake River water rights during the 1926 season was entered into at Rupert, Idaho, on May 22. The agreement between the United States and the Upper Snake River Valley Water Users' Protective Union and approved by representatives of the irrigation districts on the Minidoka project and officials of the Twin Falls projects, sets forth a plan by which owners of decreed rights in the upper valley will be permitted to make use of Jackson Lake Reservoir for storing normal flow and also make temporary transfers among themselves on condition that all water so stored or transferred is subject to a toll charge of 17½ per cent, payable to lower valley users. It is believed that these privileges will be of great value to canals whose normal flow rights are likely to become invalidated by midsummer, as it will enable them to hold some water back for the irrigation of later and more valuable crops, such as potatoes and sugar beets.

## NEW SOUTH WALES PLANS TO CONSTRUCT LARGE DAM

H. H. Dare, commissioner, Water Conservation and Irrigation Commission, New South Wales, Australia, has written to Commissioner Mead as follows concerning proposed water supply development in that country:

"I am very much indebted to you for your kindness in forwarding the NEW RECLAMATION ERA, which contains some articles of great interest. I am especially interested in the section of the proposed Colorado River Dam, which represents such a tremendous advance in height and capacity over anything yet attempted.

"We are at the present time considering a large dam on the Warragamba River, principally for the supply of water for Sydney. On account of the magnitude of the flood to be provided for, and the height of the structure, this will be a considerable undertaking, but not, of course, in any way approaching the Colorado."

THE early pea crop on the Strawberry Valley project has been harvested, and yields of about three-fourths of a ton per acre were reported. The growers received \$75 a ton for these early peas. Prospects are excellent for abundant yields of all crops.



The Lingle power plant on the North Platte project, Nebr.-Wyo.

## Weed and Trash Screen for Canals

*Sunnyside Division, Yakima Project, Wash.*

*By J. L. Lytell, Superintendent*

**F**LOATING weeds, moss, and other debris constitute one of the most serious difficulties in the way of a successful operation of our irrigation system. Not only do they add materially to the hazard and cost of canal and lateral operation and maintenance, but are one of the chief obstacles to the continuous delivery of water necessary for the successful irrigation of the farm.

The most common type of weed screen heretofore used has consisted of iron bars, two by fours, or other timbers placed across the canal channel on slopes of varying degrees and spaced from a few inches to a foot or more apart. These were objectionable for several reasons. Under severe conditions they required an excessive amount of attention in order to prevent clogging, which limited the canal and lateral capacity by seriously reducing the cross sectional area. They were used, therefore, only where they could be given the required attention, or where clogging was less apt to occur with their use than if they had not been installed.

A type of screen has been devised by M. D. Scroggs, irrigation manager, and Dominick Carmody, maintenance engineer, on the Sunnyside division of the Yakima project, which gives very satisfactory service with such attention as the ditch rider may easily give it on his regular rounds. This type of screen, as installed at Mile 60 on the Sunnyside division, is shown in the accompanying illustration and has functioned very satisfactorily.

It is believed that by proper designing the principle on which this screen is based can be applied to almost any condition that may exist in the ordinary canal and

lateral, and thus greatly lessen the interference with the delivery of water caused by clogging of intakes to turnouts and siphons, resulting in more satisfactory delivery of water to the water user.

Although the same general principles control, each installation should be varied to meet the peculiar conditions of the location. The length and width of screen, depth of the subgrade basin, and the spacing of bars will depend upon the canal or lateral cross section, the character of debris to be handled, the amount of silt in the water, and the frequency of attention which can be given.

Certain factors have so far been noted as advisable in any installation. A depth of water of  $1\frac{1}{2}$  feet should be had over the bottom screen. The width of the bottom screen should be the same as the bottom width of the canal or lateral. There should be no cross braces and the bars should be supported only from the ends. The subgrade basin should not be less than  $1\frac{1}{2}$  feet in depth. A check placed below the screen and regulated by flashboards to maintain a uniform water surface will assist the proper functioning of the screen.

The success of the screen is due chiefly to two things. The screen area is large and while the slope portion of the screen may fill, water finding its way through the subgrade basin prevents the debris from forming a tight dam. Except under the severest and most exceptional conditions, our screens require only the ordinary attention which can be given by a patrolman on his regular route. Where silt conditions are bad, by the removal of all checks below and by allowing the screen to remain partially clogged, the subgrade basin will scour.

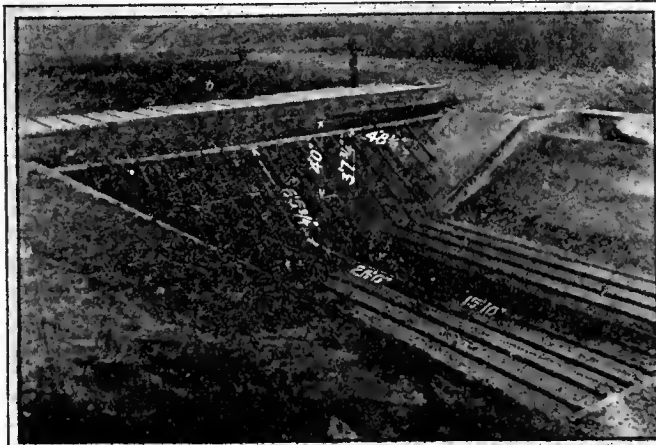
## Local Money Hard to Get for Loans on Some Lands

On some of the projects where delinquencies in payment of construction and operation and maintenance charges are most noticeable, local money as a rule is no longer available for project loans. The answer is not hard to find. In a number of cases the holders of mortgage loans have been compelled to take over certain properties and at the time of doing so have also had to pay up the delinquent charges.

A case in point happened recently. A local resident on one of the projects loaned \$5,000 on some land several years ago to two water users. Since 1921 no operation and maintenance, water rental, or construction charges were paid by the water users, for the reason that under the operations of the blanket and individual relief they were able to obtain water from year to year. During those years they received all the profits from the farm. When it became necessary to make payments in 1926 in order to receive water they relinquished the property to the lender, who, on ascertaining the delinquent charges, found it necessary, in order to pay everything up to date, to give his check to the project office for more than \$1,700.

Naturally this man is not favorably disposed toward loaning any more money on lands on this project; and in case he does loan any more money on such security, he will adopt the policy of other loan agencies of forcing the owner of the property to keep up all charges from year to year.

Breeding, feeding, diseases, common ailments of cows and their treatment, types of dairy buildings, and sanitation are discussed in Farmers' Bulletin 1470-F, "Care and Management of Dairy Cows."



Weed and trash screen, Yakima project, Wash.



## *The Sesquicentennial Exhibit*

*By the Department of the Interior*

A MODEL of a Government-irrigated farm, a miniature geyser spouting water at regular intervals, historic land maps of the United States, magnificent painted views of the National parks, a panorama of the loop district on the Alaska railroad and almost life-sized pictures of reindeer grazing in valleys surrounded by snow-covered mountains in Alaska are a few of the features included in the exhibit of the Department of the Interior at the Sesquicentennial Exposition now being held in Philadelphia.

Practically every bureau and branch of the Interior Department will participate in the exposition with an especially arranged exhibit depicting their various activities. These include the Bureau of Reclamation, National Park Service, the Geological Survey, Alaska Railroad, General Land Office, Bureau of Indian Affairs, Bureau of Education, and the Pension Office.

A feature of the exhibit is an immense poster, 5 by 8 feet in size, with a series of panels containing hand-painted photographs illustrative of the work of the various bureaus of the Interior Department. Below each picture is a brief, detailed outline of functions performed by each of the bureaus. This poster is surmounted by an immense seal of the Department surrounded by American flags.

The model of a 40-acre irrigated farm included in the Reclamation Bureau's exhibit will show irrigation water running in the canal, laterals, and farm ditches with the farmhouse, barn and other buildings in miniature as well as the various plots of ground planted to different crops. Colored enlarged photographs of some of the famous dams built by the Bureau, irrigation scenes, crops and livestock on reclamation projects will also be shown. Other displays of the bureau are a wall map, 9 feet in length, showing in colors the location of all the federal irrigation projects, another outlining the Colorado River basin, and a group of structural diagrams of engineering works.

On one side of the model farm an automatic daylight motion picture machine tells continuously the story of reclamation from the snow-capped mountains to the completed farm, showing storage and diversion dams, the desert before and after reclamation, preparing the land for crops, the first homes of the settlers, harvesting the crops, schools and other evidences of economic development.

On the other side of the model an

automatic film slide delineascope calls attention to opportunities for settlement on the projects, with particular reference to the Belle Fourche, Lower Yellowstone, and Riverton projects, where intensive settlement campaigns will be in progress this summer.

The exhibit should be of real value from an educational standpoint in calling to the attention of the millions who are expected to visit the exposition, the place which Federal reclamation holds in the economic life of the West particularly, as well as that of the country as a whole.

A replica of a log cabin with a window through which is shown the loop district of the Alaska Railroad in miniature with a train in the distance and great mountains and valleys in relief comprises one of the most novel displays of the department. In this exhibit are also a number of oil paintings of the awe-inspiring scenery along the Alaska Railroad, the only railroad owned and operated by the United States Government. The present transportation system of this northern territory, including ocean, river and railroad routes, is presented in a large colored map.

Reproduction of the Grand Canyon, the most remarkable work of erosion to be found throughout the world, will be a feature of the National Park Service exhibit together with the small model of the Old Faithful geyser in the Yellowstone National Park and another model of the crater of Kilauea Volcano in the Hawaii National Park. Striking panoramic views of other magnificent scenic effects in the various parks make up the remainder of the display of this bureau.

An original land patent signed and sealed by King George III of England, the first United States Government patent ever issued involving a tract of land in Ohio, patents signed by the Nation's early presidents, and military land bounties to Lincoln, Grant, Sherman, and other notable figures of American history are the features of the exhibit of the General Land Office. In addition, there will be illustrated the origin, manner of disposition, and present status of the public lands of the United States through maps, charts, and diagrams.

The exhibit of the Bureau of Indian Affairs is designed to show the progress made by the Indian race during the last century, through a contrast between his original mode of living and his present status. Native Indian art consisting of pieces of ancient and modern pottery,

Indian basketry and bead work, and Indian designs as taught in the Indian schools of to-day will be on display. The art of blanket weaving as practiced by the Navajo and other Indian tribes will be portrayed by a Navajo Indian woman actually weaving these articles while a Navajo Indian silversmith will also be at work making various silver ornaments.

Work of the Geological Survey in mapping rivers, measuring their flow, choosing dam sites for irrigation, water power and flood-control projects will be illustrated through enlarged photographic displays and motion pictures. One of the boats used by the engineers, who recently made an expedition down the Grand Canyon of the Colorado, will be on exhibit for the first time. The rôle played by this bureau in the development of the nation's oil industry is described by charts, maps, and photographs in conjunction with a wooden model of a derrick in motion as though drilling a well.

Pictures of renowned warriors of the United States, martial scenes, pictures of aged pensioners and survivors of the Mexican War and the living mothers of Civil War veterans will be the principle features of the Pension Bureau exhibit. Valuable documents from the archives of the Bureau, which reveal the history of the Republic, will also be displayed. A unique part of the exhibit will be stacks of arms of the different rifles used in the War of the Revolution, the Mexican War, the Civil War, War with Spain, and the World War.

An immense scenic panorama, 8 by 12 feet in size, depicting a typical reindeer herd grazing in a river valley in the mountains of Alaska with a model of an Alaska native herder in the background illustrates the reindeer industry in Alaska conducted by the Bureau of Education. Educational advancement of the United States in all its phases including elementary health hygiene, home economics, home nursery, kindergarten, rural, technical and collegiate is shown by charts, plates, pictures, and diagrams. This bureau's exhibit also presents a model of an up-to-date one-room school in the State of Delaware.

The breeding flock which is maintained to produce fertile eggs that will hatch into vigorous, healthy chicks should be fed entirely differently from the hens kept for market-egg production.

Sheep frequently suffer for water. A sheep needs from 1 to 6 quarts of water daily, depending on the feed received, the weather, and the condition of pasture.



## George Strohman Believes in Future of Umatilla Project, Oreg.

(An interview in the Hermiston Herald)

"WHAT do you think of this country as a place for a farmer to make money, and what do you think of its future?"

This question was asked the other day of a project farmer in the Herald office, after he had transacted some business that brought him in.

The man addressed thought an instant and rolled his cigar half over between his lips.

"I don't know where I could go to get along any better if I wanted to leave here," he replied. "I've been financially broke a couple of times in my life, and the going hasn't always been easy, but I don't know a better place to get ahead than this country right here.

"Of course, a man has to work hard to get ahead here. I guess that is true anywhere in the world. Then he has to use his head. Some men work from

early in the morning until 10 o'clock at night and still fail to make a go of their farming. They don't use their heads.

### DON'T DO A HALF JOB OF FARMING

"I think a man should buy what he can pay for, and what he can't afford to buy he should not buy. In farming there is no use half doing the job. I'd rather have two acres of any given crop and take care of it right than to have 10 acres and do half a job of farming it. Last year we had two acres of potatoes on our place, and they made us some nice money. We always raise all the garden truck we need, put up meat and lard, fruit and vegetables. Then we milk a few cows, never very many, and we have a small flock of chickens. Milk, cream, butter, more than enough eggs to supply our wants and a few chickens to eat whenever we want them make the actual cost of living mighty

low at our house. That makes our big crops count up pretty fast when we get the money in after selling them.

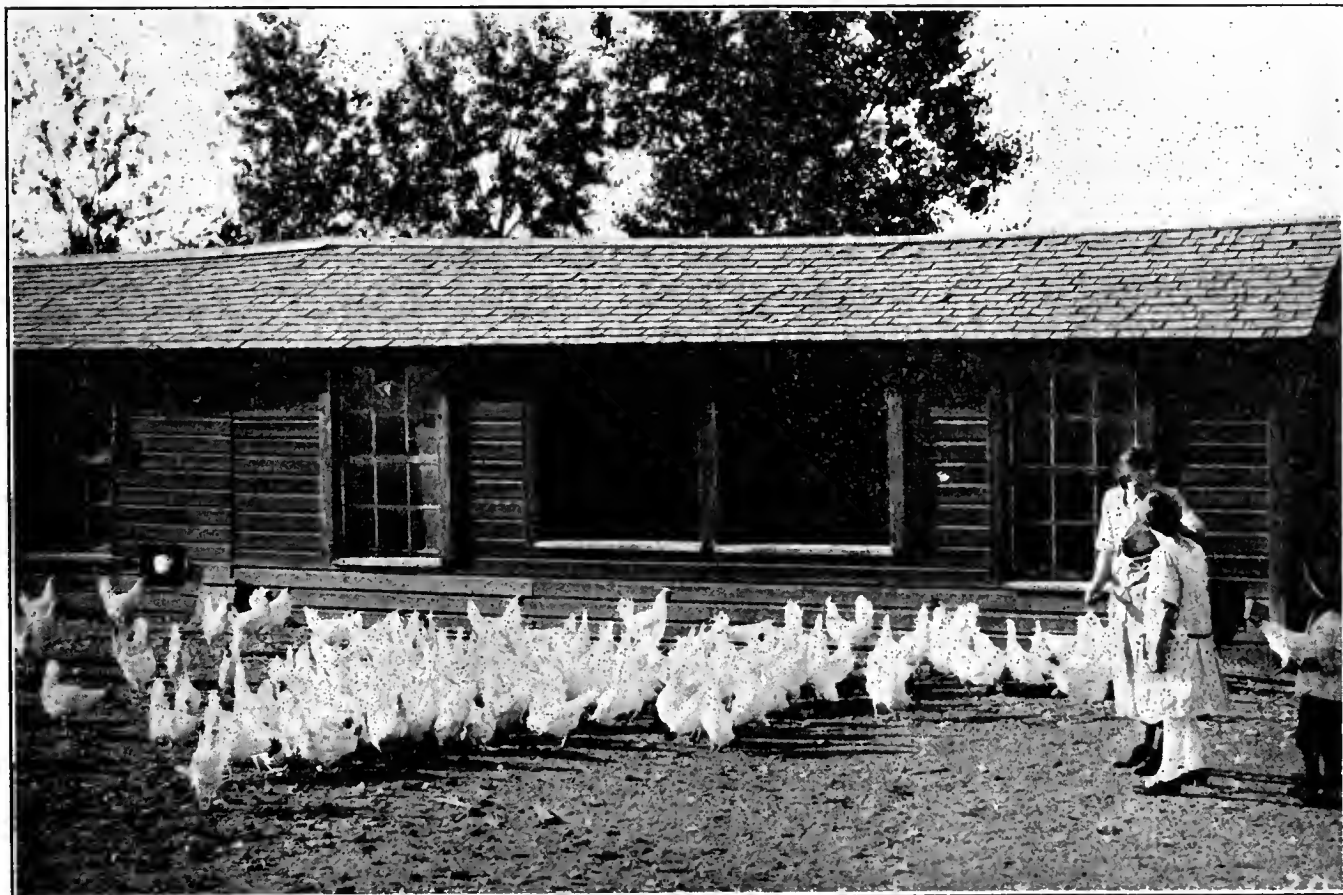
"This is a good country. Sometimes you can hear farmers talk that have the blues, but not all the discouraged farmers live on irrigated land. Go up into the wheat country. Along with a lot who have made money and kept a chunk of it a man can find others who have not been successful.

### THE HUMAN FACTOR

"In my opinion, success or failure in this farming business depends as much (or more) on the individual as on the country in which he may happen to live. I don't know of any better place, everything considered, than this Hermiston country."

The farmer who uttered the above was not giving an interview. He was visiting and talked in response to one leading question and a number of others that followed during the course of the conversation. He might have been one of a score or more of farmers living in the immediate vicinity of Hermiston.

It so happened that the farmer was George Strohman.



Chickens are a profitable source of income on many projects

## Efficiency of Irrigation

**ARIZONA** Experiment Station Bulletin No. 101 points out that every progressive farmer can easily investigate the general efficiency of his irrigation system. In the first place he should set a weir or other measuring device and keep a record of the amount of water applied to each field. His records will serve as a basis for comparisons. There are several simple means by which he can ascertain the nature and extent of his water losses. Some of the most useful are the following:

1. He can note with a watch the number of minutes during which the head end and the center and the tail end of land or furrow get water.

2. Pits dug to a depth of 6 feet with a posthole digger at different points in a field will show whether the irrigation is uniform and whether the soil is wet amply or too much. The pits should be dug about 20 hours after the irrigation. In lieu of the pits, a sharp stick can be thrust into the ground at various points, and much can be learned thereby of the penetration of the water. A better tool is a pointed metal rod with a groove 1 foot long in the side near the point. By driving the rod to any depth, rotating it there, and then withdrawing it, a sample of the soil at that depth is obtained. Better still is a soil auger; it is convenient and most useful, and every farmer can well afford to own one.

## Yield and Profit From Sugar Beets in Montana

The following table, from an article on the production of sugar beets in Montana, printed in the May and June issue of the *Irrigation Review*, illustrates clearly the relation of yields to cost of production and profits in raising sugar beets in that State:

*The cost and profit from sugar beets as related to yields per acre*

Classification (yield per acre, tons)	Per acre		Per ton	
	Cost	Profit	Cost	Profit
4 and less.....	\$43.13	-\$19.66	\$12.59	-\$5.74
4.1 to 5.....	45.18	-12.66	9.20	-2.50
5.1 to 6.....	46.91	-7.20	7.87	-1.21
6.1 to 7.....	51.36	-5.90	7.46	-.86
7.1 to 8.....	51.52	-.56	6.50	-.07
8.1 to 9.....	55.85	1.45	6.26	.16
9.1 to 10.....	55.87	6.56	5.64	.66
10.1 to 11.....	56.07	12.84	5.14	1.18
11.1 to 12.....	59.93	16.34	5.00	1.36
12.1 to 13.....	58.61	23.48	4.58	1.83
13.1 to 14.....	60.47	28.15	4.32	2.02
15.1 to 16.....	64.69	33.95	4.06	2.13

3. Observation of the water level in near-by wells may indicate whether the ground-water plane is rising, due to over-irrigation.

4. Does the soil surface bake? If so there must be heavy loss of water by evaporation. A farmer can demonstrate to his own satisfaction how far evaporation losses can be reduced by cultivation by leaving a few rows uncultivated and observing the condition of the plants and the drying of the soil up to the time of the next irrigation.

The efficiency of irrigation can be defined as the ratio of that portion of the

## Explanatory Articles On New Contracts

*The August ERA will contain the first of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the Sixty-ninth Congress.*

*The first article will deal with the Kittitas division of the Yakima project. Owyhee will be the second, Riverton third, and the others will follow as plans are perfected and contracts signed.*

*The publication in the July issue of the adjustment act introduced by Congressman Smith of Idaho will be followed through several months with articles explaining contracts made with projects based on the fact-finders' act and the adjustment act. The first will deal with the King Hill project and will be followed with an article describing the contracts and adjustments under which district water users have taken over the operation of that project. The purpose of these articles is to inform the readers of the ERA of what is being done under these two far-reaching legislative acts and why.*

*Under these contracts the operation and maintenance of four important projects is assured by the water users. On three others there will be a period of preparation in which the aim will be to overcome a backward agricultural development and insure an adequate operating revenue before appropriations from the reclamation fund are cut off.*

water actually utilized by the crop to the total quantity applied to the land. It is the farmer's province to endeavor to make this ratio as high as possible and thus to decrease the amount of water needed for his ranch.

## Pressure Test for Maturity of Fruit

The maturity of fruit at picking time largely determines its dessert quality as well as its storage or transportation possibilities. Allowing the fruit to become too mature on the tree results in a product which will not carry to the market, whereas picking the fruit in a too immature condition results in an almost inedible product.

Pressure on the fruit with the thumb to determine the maturity has probably been practiced as long as fruits have been eaten by man, but this method is too indefinite for modern demands of fruit dealers and handlers. This need for definite picking standards for certain fruits which will allow them to be left on the tree as long as possible and at the same time assure their carrying through to market in satisfactory condition, has led the United States Department of Agriculture to devise an improved type of mechanical pressure tester, a description of which is given in Department Circular 350 just issued by the department.

The pressure tester is somewhat on the order of an automobile-tire pressure gauge, is of convenient portable size, and easy to use. A protruding plunger of the tester, placed against the flesh of an apple or other fruit, penetrates the flesh, recording the maximum pressure required to penetrate the fruit to a given distance, thus giving an indication of its maturity. By means of the tester and storage experiments definite picking standards are being worked out for the various fruits. The rate of softening of fruit in storage and the firmness of fruit in different stages of storage maturity are also being studied.

When these schedules have been completed, the fruit grower will know at what pressure he should pick his fruit to enable it to stand the storage and transportation conditions expected of it. The fruit dealer will be able to test his fruit in storage and determine the remaining length of time he can expect it to keep in firm condition.

A copy of the circular may be obtained free of charge, as long as the supply lasts, by writing to the United States Department of Agriculture, Washington, D. C.

## Motion Pictures Show Project Development

Motion and still pictures are being taken this summer of scenes showing the economic and social development of the irrigation projects under the Bureau of Reclamation.

Dr. Elwood Mead, Commissioner of Reclamation, left for the West on June 17, planning to return to Washington on July 21, after visiting a number of the reclamation projects, particularly in the Northwest. He was accompanied by Maurice G. Ricker, photographer, equipped with motion-picture and still cameras, who is making a thorough photographic survey of the projects visited, paying especial attention to obtaining pictures showing what has been accomplished by the water users in community development.

Mr. Ricker visited first the Southwestern projects, Carlsbad, N. Mex., Rio Grande, N. Mex.-Tex., and Yuma, Ariz., joining Doctor Mead at Berkeley, Calif. They next visited the Orland project, California, the Okanogan project, Washington, and

the Yakima project, in the same State, where work is in progress on the construction of the new Kittitas division of the project, for which appropriations were made by Congress at the present session. From that point the party planned to visit the Umatilla project, Oregon, going then to the Belle Fourche project, South Dakota, where, on July 17, the annual farm picnic of this project will be held, to be known this year as "Doctor Elwood Mead Day," in honor of the commissioner.

Mr. Ricker may also make a photographic survey of the three Idaho projects, Boise, King Hill, and Minidoka, and before returning to Washington visit the Grand Valley and Uncompahgre projects, in Colorado, and the North Platte project, in Nebraska and Wyoming.

Motion-picture reels will later be made up for distribution to educational organizations, chambers of commerce, and others interested in the relation of reclamation development to the economic life of the Nation.

take advantage of variations in demand at various markets. It has provided a service giving a complete movement from shipper to consignee without transfers or reloadings.

## Yuma Mesa Orchards Make Fine Showing

Reports from the Yuma Mesa indicate that all the orchards that have had reasonably good care are showing a wonderful growth and that another year will bring forth considerable production. Many of the young trees that will be 3 years old next spring have sufficient size and body to produce from half a box to a box of grapefruit, and if conditions are as favorable as they usually are the trees should make a very favorable showing a year from now. The results on the 500 acres planted are drawing considerable attention all over southern California and Arizona. More people are coming in to look over the Mesa and more interest is being taken. Apparently it is only a question of time when more of them will be investing. The outlook for next year is for an increased acreage of plantings over that of this year.

## Two Litters A Year Reduce Hog Costs

Hog production costs are lower when two litters of pigs are raised each year than when only one litter is raised. Adding fall pigs to the production plan means a slight increase in feed and labor costs for each 100 pounds of pork produced. Other costs, however, are decreased chiefly because it is easier to save pigs at weaning time in the summer than in the spring. The economy of producing two litters a year is also shown in a lower necessary capital investment. Maintenance costs of the breeding herds are slightly higher when two litters are raised, largely because sows are on the farm for a longer time. On a monthly basis there is practically no difference.

## Motor Truck Proving Great Aid to Farmers

Transportation of farm products by motor truck has increased tremendously in the last few years, particularly in dairying and livestock regions. This development has not, however, with a few local exceptions, invaded the proper and profitable field of the railroads. Usually motor-

truck and railway service are complementary and not competitive.

The motor truck has increased farm efficiency, developed old markets and established new ones, speeded the conversion of raw material into finished products, facilitated marketing and distribution, and made it possible for farmers to

These projects have helped in the conquest, for human good, of the more difficult places of our country, and thereby have shown the great value of the arid and semiarid region as a part of the domain which, in the providence of God, has been given to our country.



A group of mortgage lifters on the Huntley project, Mont.

## Organization Activities and Project Visitors

A MEETING of the Commission on the Equitable Use of the Waters of the Lower Rio Grande, of which Commissioner Elwood Mead is chairman, was held in his office, beginning June 26. The other members of the commission are Gen. Lansing H. Beach and W. E. Anderson. Miss Mae A. Schnurr, secretary to Commissioner Mead, has been designated secretary of the commission.

Consulting Engineer A. J. Wiley was called to Denver recently to serve on a board meeting in connection with plans and specifications for the Stoney Gorge Dam on the Orland project.

Barry Dibble, consulting engineer, called at the Denver office in regard to the question of furnishing temporary power to the Minidoka project in lieu of developing additional power at Minidoka Dam for American Falls.

State Engineer F. C. Emerson visited the Denver office to arrange for the completion of the reports on cooperative investigations under contract with the State of Wyoming.

C. H. Howell, engineer in the Denver office, has submitted his resignation to accept the position of designing engineer for the Middle Rio Grande Conservancy District, of which J. L. Burkholder, former drainage engineer of the bureau, is now chief engineer. I. E. Houk, engineer in the Denver office, has started investigations under the cooperative contract with the district.

Porter J. Preston, superintendent of the Yuma project, made an inspection recently of the foundation for the Horse Mesa Dam on the Salt River project.

Superintendent L. J. Foster and Chief Clerk G. H. Bolt, of the Uncompahgre project, were on the Grand Valley project recently to arrange for the transfer of equipment to the Uncompahgre project.

Acting Superintendent Stuver, Newlands project, was in Reno recently to confer with District Counsel Coffey, United States Attorney Springmeyer, and Roy W. Stoddard, attorney for the district board, regarding the Carson River adjudication suit.

Earle R. Mills, who has been chief clerk of the Boise project for the past 10 years, has been transferred to the Kittitas division of the Yakima project.

District Counsel Stoutemyer spent some time on the Minidoka project in conference with other attorneys and irrigation officials upon the matter of securing an agreement between upper and lower Snake River Valley interests concerning water rights. Other visiting officials were the members of the committee of nine of water district No. 36, including John Hart, chairman, Rigby; John E. Kelly, Shelley; L. C. Walker, Aberdeen; W. O. Cotton, Idaho Falls; Frank A. Miller, St. Anthony; Eph. Peterson, Rexburg; R. E. Shepherd, Jerome; and T. M. Baird, Twin Falls. Others present were John Lee, secretary, G. Clyde Baldwin, water master, and James Heath, president of the Upper Snake River Valley Water Users' Protective Union; Joseph Peterson, attorney, Pocatello; Frank Bower, director, and J. R. Bothwell, attorney, Twin Falls Canal Co.; Adam Barclay, attorney, Jerome; Maurice Myers, attorney, Aberdeen; and F. A. Banks, construction engineer, American Falls.

W. L. Drager has been detailed from the Denver office as resident engineer on the completion of the St. Mary's and Hall's Coulee siphon crossings, Milk River project.

H. H. Johnson has been designated superintendent of the Milk River project, succeeding G. E. Stratton who has been placed in charge of the Heart River investigations.

J. R. Yates, Carlsbad project, spent several days in Las Vegas in connection with the Pecos River adjudication suit.

Miss Dorothy Shott, assistant clerk on the Riverton project, resigned during May.

Erle H. Reed, attorney, and Joyce Teppet, president of the board of commissioners, Torrington, Wyo., spent several days in the Washington office representing the Goshen Irrigation District, North Platte project, in negotiating a contract.

Cost keeper C. L. Harris, formerly employed in the Hatch office, Rio Grande project, has been transferred to the main office to fill the vacancy caused by the separation of timekeeper M. W. Nichols.

Rosendo Reinoso, of the Bureau of Public Works, Department of Commerce and Communications, Philippine Islands, was a recent visitor in the Washington office, studying methods of accounting and office administration of the bureau.



Commission on the Equitable Use of the Waters of the Lower Rio Grande. Left to right: Miss M. A. Schnurr, secretary; Gen. Lansing H. Beach; W. E. Anderson; Dr. Elwood Mead, chairman

tion to taxation of unpatented entries, which has been the continuous practice in that county. A meeting was held with the county auditor, the county attorney, and one commissioner.

O. G. Boden, engineer on the Riverton project, has been transferred to the Kittitas division, Yakima project, to take charge of the work of lateral locations.

The proposed Colorado River development, with its provisions for flood control, irrigation, and power generation, will change the entire economic aspect of the Southwest.







Imperial Valley watermelons

## The Water Supply On the Projects

A very light irrigation supply and serious crop damage are now certain on the Okanogan project in Washington, as storage on which the project is normally dependent after June 1 is now practically exhausted.

Light shortages of irrigation water will probably occur on the Milk River and Sun River projects in Montana, the Boise and Minidoka projects in Idaho, the Orland project in California, and the Salt River project in Arizona, with material crop damage avoidable by the efficient and economical use of available water.

On the Truckee lands of the Newlands project a moderate shortage of irrigation water will occur unless summer rains are received such as occur in occasional years.

By a praiseworthy combined effort of the contractor and the owners of American Falls Reservoir a considerable storage capacity was provided to catch waste waters in late spring, but unusually low run-off permitted only partial use thereof. For the benefit of irrigation, generally, in the Snake River Valley of eastern Idaho, storage interests in Jackson Lake extended a temporary storage privilege to the valley as a whole in order that waters which would otherwise be utilized at this time will later be available for maturing the more valuable crops. The anticipated result is an increase of several million dollars in crop values.

The value of Federal potato grades was found to be such that with the termination of the Food Administration the trade continued the voluntary use of the grades, and it is estimated that at least 80 per cent of the total shipments of potatoes in the United States are now quoted on the basis of the Federal grades.

## President of Haiti Studies Reclamation

President Louis Borno of the Republic of Haiti, who is on an official visit to the United States, conferred with Secretary Work of the Interior Department on reclamation and irrigation problems on June 16.

Accompanied by his party, President Borno came to the Interior Department building at 9 a. m. and spent several hours obtaining information on the reclamation and irrigation activities of the American Government.

Reclamation Commissioner Elwood Mead took the Haitian President and his staff through the offices of the bureau.

Cooperative organizations are beginning to realize more than ever before that production and marketing are inseparable and that often the solution of a marketing problem may be found to originate in production practices.

## COMPARATIVE COLLECTIONS, FEDERAL IRRIGATION PROJECTS

State	Project	Construction				Operation and maintenance			
		April, 1925	April, 1926	Fiscal year 1925 to Apr. 30, 1925	Fiscal year 1926 to Apr. 30, 1926	April, 1925	April, 1926	Fiscal year 1925 to Apr. 30, 1925	Fiscal year 1926 to Apr. 30, 1926
Arizona	Salt River			\$599,326	\$643,862				
Arizona-California	Yuma	\$6,058	\$6,033	349,376	340,212	\$6,889	\$6,024	\$297,837	\$222,356
California	Orland	4,802	3,178	33,342	79,499	733	1,300	25,727	34,157
Colorado	Grand Valley	(1)	(1)	(1)	(1)	10,380	8,488	42,661	52,300
	Uncompahgre	833	22,704	24,941	113,541	4,475	20,902	74,749	129,854
Idaho	King Hill							71	161
	Minidoka:								
	Gravity	1,886	32,199	60,311	133,230		19,756	12,639	31,407
	S. S. Pumping	508	1,898	30,359	70,754	197	1,170	36,186	47,670
Idaho-Oregon	Jackson Lake			31,970	39,982	12,047	5,637	12,056	5,748
Montana	Boise	54,572	2,759	196,999	118,592	7,987	2,906	90,938	132,739
	Huntley	230	1,632	17,125	23,146	1,141	2,255	26,912	30,866
	Milk River	(1)	(1)	(1)	(1)	185	1,814	13,748	16,019
	Fort Shaw	956	310	7,086	6,606	484	334	6,925	6,971
	Greenfields	(1)	(1)	(1)	(1)	84	903	10,816	13,540
Montana-North Dakota	Lower Yellowstone		2,298	3,350	12,847		6,999	5,221	17,603
Nebraska-Wyoming	North Platte:								
	Interstate	689	706	24,833	24,643	3,725	7,444	41,617	45,469
	Ft. Laramie	(1)	(1)	(1)	(1)	5,150		34,753	33,166
	Storage		3,131	31,989	20,290	5,769	1,544	12,633	4,558
Nevada	Northport							22,748	23,381
	Newlands	5,813	4,968	38,841	53,561	14,556	10,475	93,590	118,431
New Mexico	Carlshad	207	1,723	66,520	46,636	328	1,240	63,838	36,472
New Mexico-Texas	Rio Grande	10,335	5,283	191,236	216,677		25,000	201,763	97,683
North Dakota	Williston					3,960		8,960	
Oregon	Umatilla		160	5,730	417		45	17,579	7,945
Oregon-California	Klamath	323	2,200	60,007	34,289	433	3,144	49,767	39,598
South Dakota	Belle Fourche								
Utah	Strawberry Valley	5,225	9,668	68,691	101,288	526	1,005	24,470	30,918
Washington	Okanogan		629	1,068	5,234		2,772	3,998	31,956
	Yakima:								
	Sunnyside	5,871	52,698	55,864	160,821	27,778	78,474	70,515	149,493
	Tieton	22,045	18,730	129,261	169,835	9,938	9,223	80,036	81,947
	Storage		2,300	25,435	82,975	1,698	890	20,577	17,886
Wyoming	Shoshone:								
	Garland	1,223	1,700	9,688	25,439	1,728	661	14,117	34,693
	Frannie	(1)	(1)	(1)	(1)	2,220	1,291	5,873	4,980
Total		121,576	176,907	2,062,748	2,524,436	122,411	221,756	1,418,320	1,499,967

1 Projects on water rental basis.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

P. W. Dent, Assistant to the Commissioner

C. A. Bissell, Chief of Engineering Division

W. F. Kuhach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. G. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Dehler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Cadan, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	J. B. Bond.....	W. C. Berger.....	W. C. Berger.....	Ottamar Hamele.....	El Paso, Tex.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	J. P. Siebenalcher.....	M. M. Wilson.....	E. E. Roddis.....	Billings, Mont.
Huntley.....	Ballantine, Mont.....	A. R. McGinness.....				
King Hill <sup>2</sup> .....	King Hill, Idaho.....					
Klamath.....	Klamath Falls, Greg.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	Do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Newlands.....	Fallon, Nev.....	D. S. Stuyar.....	O. B. Snow.....	Miss F. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte.....	Mitchell, Nebr.....	H. W. Bashore.....	L. H. Mong.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	Ottamar Hamele.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	V. E. Hubbell.....	Wm. J. Burke.....	Mitchell, Nebr.
Salt River <sup>3</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>4</sup> .....				
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	J. R. Pasewalk.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	H. M. Schilling.....	C. M. Voyer.....	C. M. Voyer.....	B. E. Stoutemyer.....	Portland, Oreg.
Umpahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	B. E. Stoutemyer.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>5</sup> .....	H. N. Bickel.....	G. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>5</sup> .....	Chas. Klingman.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Umatilla, McKay Dam.....	McKay Dam, Oreg.....	R. M. Conner <sup>6</sup> .....	C. B. Funk.....	W. S. Gillogly.....	B. E. Stoutemyer.....	Portland, Oreg.
Kittitas.....	Ellensburg, Wash.....	Ralph Lowry <sup>5</sup> .....	Walker R. Young <sup>6</sup> .....	do.....	do.....	Do.

<sup>1</sup> Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.

<sup>2</sup> Project operated by King Hill irrigation district.

<sup>3</sup> Project operated by Salt River Valley Water Users' Association.

<sup>4</sup> General Superintendent and Chief Engineer.

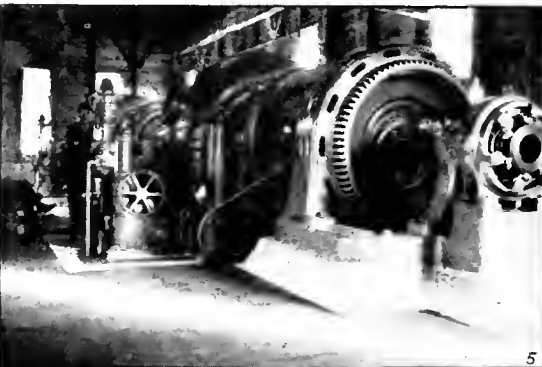
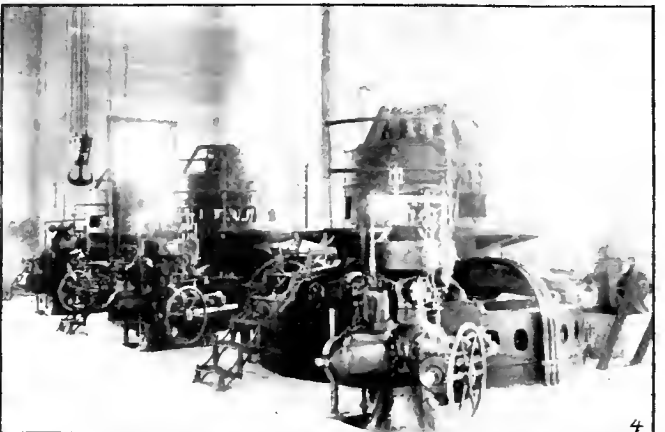
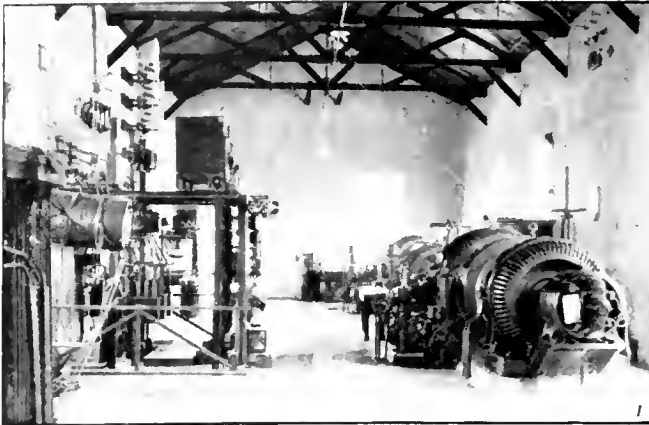
<sup>5</sup> Resident Engineer.

<sup>6</sup> Construction Engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Sacramento Valley.....	Ellensburg, Wash.....	Walker R. Young.....	Sacramento Valley Development Association and State of California.
Dubois.....	American Falls, Idaho.....	F. A. Banks.....	Dubois Project Finance Association.
Spanish Springs storage.....	Fernley, Nev.....	A. W. Walker.....	
Harney Valley.....	Boise, Idaho.....	R. J. Newell.....	
Gwyhee.....	do.....	do.....	
Vale.....	do.....	do.....	
Salt Lake Basin.....	Salt Lake City, Utah.....	W. M. Green.....	State of Utah.
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	State of Wyoming.
Heart River.....	Denver, Colo.....	G. E. Stratton.....	

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION

- 1. INTERIOR OF POWER PLANT ON INTER-STATE CANAL, NORTH PLATTE PROJECT, NEBRASKA-WYOMING
- 2. INTERIOR OF POWER PLANT UNIT B, YUMA WESA YUMA PROJECT, ARIZONA
- 3. BOISE DIVIDE ON DAM AND POWER HOUSE, BOISE PROJECT, IDAHO
- 4. INTERIOR OF BOISE POWER HOUSE
- 5. INTERIOR OF POWER HOUSE NO. 2, YAKIMA PROJECT, WASHINGTON
- 6. WILCOX POWER HOUSE
- 7. INTERIOR OF MINIDOKA POWER HOUSE
- 8. INTERIOR OF SOUTH SIDE PUMPING PLANT, MINIDOKA PROJECT, IDAHO



HYDROELECTRIC POWER PLANTS ON THE IRRIGATION PROJECTS OF THE BUREAU OF RECLAMATION

# NEW RECLAMATION ERA

VOL. 17

AUGUST, 1926

NO. 8



HARVESTING THE GOLDEN GRAIN ON A FEDERAL IRRIGATION PROJECT



VISION  
HAS RESULTED IN  
TRANSFORMING  
THE DESERT



INTO AN  
IRRIGATED  
GARDEN



# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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## *Interesting High Lights on the Reclamation Projects*

**S**HIPMENTS of agricultural products from the Yuma project during June amounted to 322 carloads valued at \$132,850. Since the beginning of the year the total value of such shipments has amounted to \$1,493,050. In addition, there have been numerous express shipments of garden truck, grapes, etc.

**O**N the Uncompahgre project 940 of the 1,028 delinquent accounts have been cleared for water for the irrigation season by the payment of delinquent charges. About 97 per cent of the lands which received water during 1925 are cleared for water for 1926.

**A** CLOUDBURST on the drainage area of Dunlap Creek, Lower Yellowstone project, did considerable damage to the paving below Dunlap Creek conduit. Permanent repairs, estimated to cost \$4,000, have been approved.

**A**T Guernsey Dam, North Platte project, 59,781 cubic yards of gravel and puddle material were placed in the dam section during June, and at the end of the month the gravel fill portion was approximately 59 per cent complete. Based on gross contract earnings, the dam was 62.9 per cent completed at the end of the month.

**A** LARGE meteor struck the side of a mountain recently near Sand Springs, 30 miles east of Fallon, Newlands project, tearing away a large quantity of rock amid great clouds of dust. Several days prior, another brilliant meteor traveled over the project, apparently striking the earth somewhere to the north. This meteor was accompanied by loud and prolonged rumbling which awakened project residents about 2 a. m. Many thought that a powder magazine had exploded somewhere on the project.

**J**ACK rabbits have been invading the irrigated lands on the Minidoka project, causing a great deal of damage to crops. A number of drives have been made at which several thousand rabbits were killed, but the best results seem to be obtained through poisoning. One farmer reported a count of 650 rabbits killed with one ounce of strychnine.

**A**T American Falls Dam, the concrete was brought up to the crest in the spillway section. About 16,700 cubic yards of concrete were poured during June. Good progress was made in the construction of the right embankment, more than 10,000 cubic yards of earth being placed, sprinkled, and rolled.

**T**HE widespread reputation of "Fallon turkeys" from the Newlands project among the elite dining-car and hotel trade has been gained by local methods of growing and feeding which produce prime birds. From the time they are a month old until ready for market the birds are put on full feed, consisting largely of skimmed milk, augmented by grain ration during the latter part of the fattening period.

**T**WO hail storms, one at the upper Otis district and one in the lower Loving district, Carlsbad project, damaged, more or less, about a thousand acres of cotton recently. On some of the fields growth was delayed and crops set back for a few weeks, and in a limited area crops were wiped out altogether and had to be replanted.

**T**HE Powell Creamery, Shoshone project, had the best month in its history recently. It bought 15,600 pounds of butterfat, and manufactured 18,500 pounds of butter and 700 gallons of ice cream. Other agencies purchased 4,100 pounds of butterfat, the price of which was 33 cents a pound in sour cream and 50 cents a pound in sweet cream.

**T**HE recently organized Churchill Poultrymen, (Inc.), on the Newlands project, continue to ship eggs to the Los Angeles market by refrigerator freight with satisfactory results. The association is also endeavoring to assemble broilers and fryers in carload lots for the same market. The 1926 turkey crop promises to be the largest in the history of the project.

**R**ECENT development on the projects includes a \$200,000 hotel at Yuma, to be opened in the fall; a new school at Las Cruces, and a new church and a public school at Hatch, Rio Grande project. The city of Klamath Falls has voted a \$62,000 bond issue to provide funds for one-half the cost of a viaduct over the Southern Pacific Railroad yards. This also fulfills an agreement whereby the Southern Pacific Co. is to construct yards and shops estimated at cost \$800,000.

**A** RECENT survey of registered and grade bulls on the Newlands project shows that 66.7 per cent of all dairy herds of more than five cows are headed by purebred sires.

**A**T McKay Dam, Unatilla project, all work on the spillway had been completed at the end of June with the exception of the installation of the hoisting mechanism. Work on placing the concrete paving on the upstream face of the dam has continued without interruption.

**L**ISTING of unoccupied land and tracts held by nonresidents on the Belle Fourche project is progressing, and recently sale terms had been filed on 135 farms covering 11,000 irrigable acres.

**S**ETTLEMENT opportunities on the Belle Fourche, Lower Yellowstone, and Riverton projects are being featured by means of an automatic film slide delineascope at the Sesquicentennial International Exposition at Philadelphia.

## Construction of Kittitas Division, Yakima Project, Washington

*The first of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the 69th Congress*

### ENGINEERING FEATURES

ON the Kittitas division of the Yakima project, in the State of Washington, works will be constructed for the irrigation of about 72,000 acres of land. The main body of irrigable land lies in the vicinity of the town of Ellensburg, which is on the Yakima River and not far from the geographical center of the State of Washington.

From an engineering and construction standpoint, the project is a comparatively simple one, involving very few unusual features. The irrigation plan contemplates the diversion of water from the Yakima River just above the town of Easton into a main canal on the southerly side of the river. Water for irrigation will be supplied from the natural flow of the Yakima River and from the reservoirs that are already built and operated by the Bureau of Reclamation at Kachess and Keechelus Lakes. No new storage reservoirs are to be constructed in the work now beginning.

### THE DAM

The diversion dam will be located in a narrow, boxlike canyon, out of which it will raise the water about 43 feet above low-water stage into the intake of the main canal on the adjoining bench. The site is very favorable for an economical structure. Solid rock is exposed on both abutments and in the river bed, and the main lines of two transcontinental railroads pass the site. The dam will be a straight, gravity type, concrete structure about 65 feet in height above the stream bed, and 248 feet in overall length along the crest, including the canal heading. A single, floating, drum-type gate 64 feet long by 14.5 feet high will be mounted on top of the dam in its central part and will automatically control the water level above the dam, passing, when wide open, a flood of 13,000 second-feet. Two 4.8 by 6 foot sluice gates will also be installed through the dam near the river bed. A fish ladder will be provided in the left abutment, and the intake to the main canal, controlled by two 12 by 11 foot radial gates, will be placed in the right abutment.

### THE MAIN CANAL

The main canal will flow in a general southeasterly direction parallel to the Yakima River and on the southerly side thereof for a distance of about 26 miles,

dividing at this point into two main branches. The larger, or North Branch, which will be 52 miles in length, will immediately cross the Yakima River and flow in an easterly direction, thence swinging south, and finally turning and flowing westerly to a point near the Yakima River, nearly encircling the Kittitas Valley, in the center of which is the town of Ellensburg. The smaller, or South Branch Canal, 14 miles in length, will remain on the south side of the river and flow in a southerly direction, covering the lands lying west of the river. The main body of the project is 28 miles long and 12 miles in width.

The main canal will have a capacity at its upper end of 1,320 second-feet. Its cross section in earth will be 30 feet wide on the bottom and 79 feet wide on top, with a water depth of 11.35 feet. A large portion of the canal will be lined with concrete, and for this construction the bottom width will be decreased to 12 feet and the water depth to 9.75 feet.

The valley of the Yakima River within the area traversed by the main canal is narrow, with precipitous ranges of hills on each side. At the upper end these hills are largely wooded, but the woods gradually give way to open bunch-grass and sagebrush country toward the lower end. The canal leaves the narrow bench adjacent to the river within a short distance from the diversion dam, gradually climbs the adjoining hills and follows these comparatively steep slopes in a tortuous course throughout its length. At its lower end the main canal is about 400 feet in elevation above the river.

The main canal will cross several small streams in canyons of considerable size. These streams will in general be crossed by inverted siphons and these will form the principal structures. There will be 10 such siphons, in general about 12 feet in diameter and of reinforced monolithic concrete construction. The hydrostatic head on these siphons will range up to a maximum of about 245 feet, and for the higher heads riveted steel pipes will be used instead of concrete. Other important structures on the main canal will be the crossings under the Northern Pacific and the Chicago, Milwaukee & St. Paul Railway tracks and four wasteways, to discharge water back into the river, located at approximately uniform intervals along the canal. The main canal will also include one short tunnel through a rocky point and possibly one reach of concrete bench flume about 2,400 feet

long. Of the 26.2 miles of main canal, about 14.8 miles will be concrete lined, 9.4 miles will be unlined earth section, and the remaining 2 miles will be taken up by the structures.

### CANALS AND SIPHON

The outstanding feature of the North Branch Canal and the most extensive single structure on the entire project is the siphon carrying this canal across the Yakima River. The plans for this structure provide for a riveted steel pipe supported on concrete piers and carried across the main river channel on a high steel bridge. The pipe will have a maximum diameter of 12 feet; will operate under a maximum hydrostatic head of 300 feet, and will be about 1 mile long. The intake and outlet structures will be of concrete.

Leaving the Yakima River siphon, the North Branch Canal traverses the north and east side of the valley a distance of 35.7 miles to Wippel Creek, where a drop and pumping station are proposed, and beyond this point three branches are carried around a small valley called Badger Pocket. At the Wippel Creek drop a direct-connected turbine and pumping plant are planned to lift water about 130 feet and irrigate 2,500 acres of land above the gravity canal. The static head on the pumping plant will be 82 feet. Beyond the pumping station the power water will be used for the irrigation of the lower lands in Badger Pocket and along the south side of the valley to the river where a terminal waste ditch will discharge.

Of the 35.7 miles of the North Branch Canal above Wippel Creek, 25.1 miles will be unlined earth section; 6.3 miles will be concrete lined, and the remaining 4.3 miles will be taken up in structures, including 4 tunnels, 1 bench flume, and 7 siphons. Wasteways are planned at Caribou, Johnson, and Badger Creeks, which, together with the long waste channels required, constitute structures of considerable magnitude.

The South Branch Canal will follow along the foothills of the southwest side of the valley from the point of division to Manastash Creek. Of the 14.2 miles of this canal, 11.2 miles will be unlined earth section, 1.1 miles will be concrete lined, and the remaining 1.9 miles will include 1 elevated flume, 1 tunnel, and 2 siphons.

Detail plans and location have not yet been worked out for the distribution system which will deliver water to the indi-

vidual farm units. This system will be constructed in accordance with the standards of the Reclamation Bureau and the usual types of structures will be provided. The distribution system will not require any laterals of considerable size other than the two main branch canals already described.

Permanent improvements for operating purposes, consisting of headquarters building and grounds, 14 patrol houses, gate tender's house at the diversion dam, and the operator's house at Wippel pumping plant, are contemplated. A telephone system, comprising an aggregate of 100 miles of line, is also provided for in the estimates.

### DRAINAGE

It is estimated that eventually an area of about 7,000 acres of the irrigable lands will need drainage. The natural drainage courses that traverse the irrigable area are shallow, and these will probably have to be deepened and improved to care for the increased run-off due to irrigation. These improved natural channels will also probably have to be supplemented by lateral drains and structures. It is not contemplated that any of this work will be done until the need arises, as it will not be practicable to properly locate and design the drainage works until seepage conditions develop.

It is planned that the irrigation system and structures will be of the most substantial and permanent nature. Canals will be largely lined with reinforced concrete and substantial reinforced-concrete construction will predominate in the structure work. The estimated cost for surveys and construction, exclusive of storage facilities already provided, is approximately \$9,000,000, of which over 80 per cent will be required for the canal system. The main canal and diversion works are estimated to cost over \$3,000,000, and the funds now appropriated will be expended mainly on these features.

### CONSTRUCTION BY CONTRACT

Construction will be undertaken in convenient and economical units and will be performed under contracts awarded under competitive bidding. Contract for the first division of the main canal, including about 4 miles, has already been awarded, and the work is now under way. The second division, including about 10 miles of the main canal, will be advertised in the near future, and bids will be invited on additional work as soon as final location surveys, designs, and specifications can be completed. The rate at which the work will be prosecuted will depend on the funds available. The engineering and

construction work is under the direction of the chief engineer, with headquarters at Denver, Colo., who is represented on the work by a construction engineer, with headquarters at Ellensburg, Wash.

### THE CONTRACT

February 16, 1921, the Kittitas reclamation district entered into a contract with the United States for the purchase of 260,000 acre-feet of water per annum for which payment is to be made in 40 semiannual installments. The exact amount to be paid was left for later determination, but the probable cost was stated in the contract as \$1,710,000. The first 8 of the semiannual installments was each to be 1 per cent, the next 4 each 2 per cent, and the next 28 each 3 per cent, of the total cost. The theory of this contract was that the district was to construct its own diversion dam and distribution system, the United States furnishing merely the reservoirs and water supply from the Yakima project.

The district being unable to finance the construction of its diversion dam and distribution system, the contract of December 19, 1925, with the United States provides that the Government will expend not to exceed \$9,000,000 for the construction of a diversion dam in Yakima River, in sec. 11, T. 20 N., R. 13 E., Willamette meridian, and a canal system extending therefrom, the canal system to consist of a main canal and branch canals and structures in connection therewith. Such distribution system is to be constructed as the Secretary finds to be necessary and capable of

construction within the limit of expenditures indicated.

The contract makes performance by the United States contingent upon Congress appropriating the necessary funds from year to year to carry out the program. The United States is to utilize in the construction of canals any right of way it may have reserved in patents issued under the act of Congress of August 30, 1890 (26 Stat., 391). Any other right of way needed is to be obtained by the district by purchase or condemnation, although the cost of same is to be paid by the United States.

### ISSUANCE OF PUBLIC NOTICES

As required by the law the Secretary is to issue two public notices relative to the construction charges. The first public notice is to be issued when the land is ready for settlement and will announce the construction charge per irrigable acre. The second public notice is to be issued when in the opinion of the Secretary the agricultural development of the lands shall have advanced sufficiently to warrant the commencement of the payment of installments of the construction charge. The second public notice will fix the date when payments will begin on the construction charge announced by the first public notice, but this date can not be more than five years later than the date of the first public notice.

The annual payments are to be based on the productive power of the land. Each installment is to be 5 per cent of the average gross annual acre income for the 10 calendar years first preceding

(Continued on p. 132)



A cornfield in the Yakima Valley, Wash.

## The Kittitas Contract and Provisions for Settlement Promotion

*The contract of December 19, 1925, provides that the Government will expend not to exceed \$9,000,000 for the construction of a diversion dam in Yakima River and a canal system extending therefrom—Settlement plans*

(Continued from p. 131)

or for all years of record if fewer than 10 years' record is available, of the area in cultivation.

After the completion of the construction program, the district is to operate and maintain the irrigation works. The United States is to have the right to inspect the works and to require the district to make needed repairs, or the United States may make such repairs and charge the cost to the district.

### ASSESSMENTS FOR PAYMENTS

The district is to levy assessments or taxes upon the land in the district in order to raise the money needed to make these payments to the United States. The district is obligated to make the payments, notwithstanding the default of some of the landowners in meeting their assessments. The Government may refuse to deliver water to the district if it defaults for a period of more than one year in any payment due to the United States under the contract. Or, if the Government prefers, it may reduce the amount of water delivered proportionately, and the district is then to refuse to deliver water to landowners who are more than one year in default in the payment of any of their water charges.

In order to protect the United States during the period when the construction charges are not paid in full, the district is to employ an irrigation manager who is to be satisfactory to the United States, and who may be discharged if he is found by the Secretary of the Interior to be incompetent or otherwise unsatisfactory. Water can not be delivered to more than 160 acres in one ownership.

### PREVENTING SPECULATION

One great difficulty with all old projects constructed by the Government under the reclamation laws has been due to speculation. The land during the construction period came into the hands of those who did not desire to farm it themselves, but to sell it to others at boom prices, owing to the expectation of benefits from the expected water supply. When the Government's debt began to mature, the land was very frequently found in the hands of an owner who had bought at an enhanced price expecting to sell at a still higher price, and who had made but a small payment for the land and had given a mortgage for the remainder. Since this transaction was based upon an inflated valuation of the

land, and since the landowner was faced by an indebtedness both for the land (usually with a high-interest rate on deferred payments) and for the water, he was often doomed to fail.

In the endeavor to prevent the land values from being inflated in this way, the contract provides for an appraisal of the land by a board of three appraisers, one appointed by the Secretary of the Interior, one by the district, and these two to select a third member. They are to appraise all of the district lands, without regard to the prospective water right. If lands are later improved by the erection of buildings, etc., the added improvements may be appraised at the expense of the landowner. When land in the district is sold the vendor and vendee are to report the facts of the sale to the district and land is to have no right to receive water from the project works unless such report is made.

If any land after the appraisal is sold at a price in excess of the value fixed in the appraisal, plus any water-right payments made, one-half of such excess is to be paid to the district and is to be applicable upon the water-right charges. This is based upon the just theory that the project expenditure was responsible for such enhancement in value, and therefore the project should share in the profit arising from the sale of the land. The provision will undoubtedly have a tendency to prevent a runaway boom in land values such as crippled some of the older projects for a considerable period.

The contract provides for its confirmation by the court, as permitted by the Washington statutes, and such confirmation decree has been entered.

### PROMOTION OF SETTLEMENT

The foregoing contract is accompanied by a contract dated December 19, 1925, between the United States and the State of Washington by which the State assumes the duty and responsibility of promoting the development and settlement of the Kittitas division after completion, including the subdivision of lands held in private ownership by any individual in excess of 160 irrigable acres, and the securing, selection, and financing of settlers to enable them to purchase the required livestock, equipment, and supplies and to improve the lands so as to render them habitable and productive. The State is to provide funds necessary for the purchase, but not in excess of \$300,000.

### LOCATION AND AGRICULTURE

The arable land of the Kittitas Valley is in the upper reaches of the Yakima River watershed, in the State of Washington, and has an elevation of from 1,700 to 2,100 feet. A portion of the floor of this valley has been irrigated for many years, which provides ample demonstration of the character of agriculture, which should be followed on the new land to be brought under irrigation by the works to be constructed by the United States. The land to be irrigated by the new works lies around the present irrigated area in the form of a horseshoe. The natural conditions of soil and climate support a diversified agriculture. Small grains, alfalfa, clover, timothy, potatoes, and, in fact, all crops common to the temperate zone produce profitably. In favored locations apples and cherries are grown commercially. There is probably no section of this country which produces higher yields of wheat and oats when these crops are irrigated.

The division includes approximately 70,000 acres of irrigable land. Of this, about 60,000 acres are owned by private individuals in tracts varying in size from 20 acres to 800 acres. A few tracts are owned in area in excess of the latter figure: The Northern Pacific Railway owns about 3,900 acres, the State of Washington about 1,400 acres, and 5,000 acres are public land. The railroad and public land and the land owned by the State of Washington are covered with sage brush and are located at what is known as Badger Pocket, which is the most remote from towns and transportation. When all of this land, including the subdivision of areas held in excess of 160 acres, is settled, it will make homes for approximately 500 additional families.

### THE FARM UNITS

In arranging the farm unit subdivisions of the public lands, the allotment of irrigable areas and the location of boundaries will be governed largely by the quality of the soil, the topography of the land, and the location of natural barriers. This general plan will enable the settlers to choose locations best fitted to the individual desires and farming plans; it will obviate many expensive construction items in building distributaries; it will secure a more nearly compact arrangement of the cultivable area with minimum outlay for bridges and works necessary



to overcome natural barriers and provide an approach to a greater equalization of opportunities.

An appraisal committee, composed of one member representing the Secretary of the Interior, one the irrigation district, and a third selected by the first two named, has been engaged for several months in fixing the values of the land without respect to the construction of the proposed irrigation works. These values will be the basis of future sales of land and the appraisal is for the purpose of eliminating speculation, which has been one of the evils of reclamation in the past. This committee has taken into consideration the quality of the soil, the topography (which indicates the cost and difficulties encountered in preparing land for irrigation), and the nature and value of improvements, if any, on the various tracts. This appraisal thus becomes an inventory of the value of the project in its undeveloped state and an index to its productive power under irrigation.

It was realized that the benefits to come from this development and the prompt repayment of project costs will be greatly influenced by the measures taken to secure settlers. It is probable that the privately owned partially improved land can be settled by the land-owners themselves, with the assistance of the Chamber of Commerce of Ellensburg, Wash., and other related and

interested agencies. This is not true on the railroad, State, and public land. The land has an irregular surface, is covered with sage brush, and farms must be built up from the beginning.

### *The Water Supply On the Projects*

*Flow of all the streams from which the projects obtain their water supplies remained low throughout the States of Utah, Idaho, Washington, Oregon, California, and Nevada. Serious crop damage will probably result on the Okanogan project in Washington. Light shortages may occur on the Boise, Minidoka, Milk River, Yakima, and Orland projects. Pumping from the Lahontan Reservoir on the Newlands project was being resorted to in order to avert a serious shortage on the Truckee lands.*

*Heavy rains have relieved the situation on the Milk River and Sun River projects in Montana. The Grand Valley and Uncompahgre projects have a normal water supply, and conditions on the Colorado River have improved.*

*The supply for the Belle Fourche and North Platte projects continues above normal, and conditions continue favorable in New Mexico.*

### *CAPITAL REQUIREMENTS OF SETTLERS*

The farmers who take this unimproved land will have to spend money or the equivalent of it to the extent of \$5,000 to \$7,000 on 60 or 80 acres to bring it into profitable production. This is needed to clear, level, and prepare land for irrigation. It is needed to assist in the erection of houses and barns, and other improvements, and to completely equip the farm with livestock and modern tools and implements. It is not expected that settlers can be secured who have that much capital. Past experience indicates that few settlers will have enough to completely develop their farms. Settlers who have from \$1,500 to \$3,000 must be encouraged to settle at Kittitas. Because this was realized from the beginning, the State of Washington entered into a contract with the United States to secure settlers for this division, and agrees to assist these settlers to become established. It was estimated that \$300,000 would be needed to settle the raw land at and adjacent to Badger Pocket. The business men and land-owners of the Kittitas Valley have organized a corporation which it is understood will relieve the State of this responsibility.

With this corporation functioning to secure and assist settlers, and the fixing of land prices based on its productivity, should come hastened development and complete settlement much earlier than otherwise would be the case.



Where desert and garden meet



## Project Women and Their Influence in the Home and on Farm Life

*Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community*

*By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era*

### School Bound

WHEN this issue reaches the farms on our projects, the young folks will be busy getting ready to return to school.

Through the splendid initiative of the pioneers the foundation has been laid for good school facilities, and expansion is going on by leaps and bounds. This is a matter justly to be proud of. Each school is a monument to "Progressive America." Some of the school buildings erected are palatial affairs, like the one shown above, and the fact that these were made possible by taxation in the different States in which they are located shows farsightedness on the subject of making available to every-one educational facilities of the highest type.

Our people do not stop at putting up the necessary buildings, providing the best teachers, and inviting young America to come to be taught; they actually provide transportation to and from school. The best of treatment is none too good for them. One of the horse-drawn vehicles used on the Minidoka project is shown in the picture. These have been replaced by motor busses in many cases.

The summer vacation has undoubtedly benefited the young folks as the very nature of the project family's activities would afford good healthful exercise in the open air. Very little mental fatigue is experienced during the recess of school.

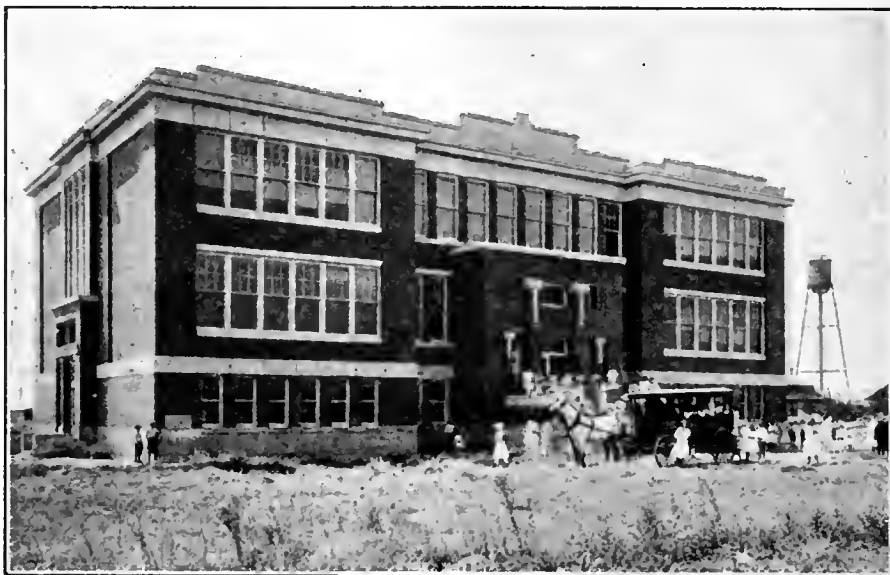
Physical energy expended must be replaced by good wholesome food.

Food must contain plenty of the right sort of material to build up and repair the living tissues of the body; enough material to use as fuel to furnish energy for heat and work, an abundance of mineral material and the little known substances which regulate body health and growth.

Children, like all young animals, require more growth or body-building material relative to their size than they do when fully grown.

For the best growth and development, a child's food must contain:

1. ANIMAL PROTEIN—found especially in milk, eggs, meat, including fish and fowl. The protein of certain vegetables and nuts contains body-building substances and will do to help out the animal protein, but will not suffice alone, for the best growth and development of the average child.



Where some of the Minidoka project children go to school

2. MINERAL MATTER—needed in the growth and functioning of the parts of the body, such as the skeleton, the blood, the brain, etc. The chief sources of these minerals are milk, eggs, meat, green vegetables, and fruits.

3. THE SUBSTANCES REGULATING GROWTH—found especially in the fat of milk, eggs, leaf vegetables, but not found in vegetable oils or pork fat.

*Whole milk contains an abundance of animal protein, minerals, and the growth-regulating substances, besides fat and sugar. No other single foodstuff is therefore so important in infancy and childhood.*

### INDISPENSABLE ARTICLES OF FOOD IN CHILDHOOD

1. Whole milk or skim milk with butter.
2. Butter.
3. Green vegetables, especially leaf vegetables.
4. Starchy foods, which are the principal sources of energy but are not growth foods.

To these four essentials it is desirable to add:

5. Some eggs or meat, including fish and fowl.
6. Sugar.
7. Fruits.

*Choose easily digested food for the child and see that it is properly cooked.*

### MEALS FOR THE PRESCHOOL CHILD

By the end of the first year, a child should have four meals a day. By the end of the second year three meals a day are sufficient for the average child.

### "PLENTY AT MEAL TIME AND NOTHING BETWEEN MEALS"

A baby at 1 year may take a quart of milk a day. After this age, as he takes more cereal and bread with egg and vegetables, reduce the milk to three cups a day. A child will take more food if he drinks most of the milk at the end instead of at the beginning of the meal.

Cereals, bread, potato, and rice are the starchy foods—the fuel foods—and should be part of every meal. Cooked cereals are best for children. Victory bread, thoroughly dried in the oven, can be used from infancy on. The child needs an abundance of fuel food as well as growth food.

Green vegetables—spinach, chard, beet greens, beets, carrots, onions, string beans, celery, asparagus—should appear in the diet by the end of the first year. These vegetables should be first used in strained soup or broth, then as purees and by the end of the second year mashed or finely divided. Peas, beans (other than string beans), and corn should not be given to

## Women on the Projects and Their Relation to Better Agriculture

*The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life*

very young children except as purees. Cauliflower and cabbage may be given to older children.

Children crave sweets, and they should be given these, especially in the noon dessert, as simple puddings, custards, home-made ice cream, fruit, jellies, or simple candy. Sweets between meals mean bad teeth and bad "tummies."

Fruits should appear daily in the diet of the child, fruit juices for the baby, stewed apples, or prune pulp later in infancy. Raw apple (at first scraped), oranges, ripe peaches, and any cooked fruit may be given to the older child. Bananas are not fit food for a child to eat unless the skin is brown or the banana is cooked.

### RIGHT SORT OF FOOD AT THE RIGHT TIME

A young child should have the principal meal at noon, including a vegetable and meat soup, or an egg, or meat (including fish and fowl), with a green vegetable, and starchy vegetable or cereal. Cereal and milk with cooked fruit make the best supper and breakfast.

Feed the child in this manner in pre-school years and you will lay the foundation for a well-developed, healthy pupil. Take the precaution before the child enters on its first year at school to see that it has had a general medical examination, defective sight corrected by glasses, hearing and speech by treatment. It will mean the difference between a dull and a bright child.

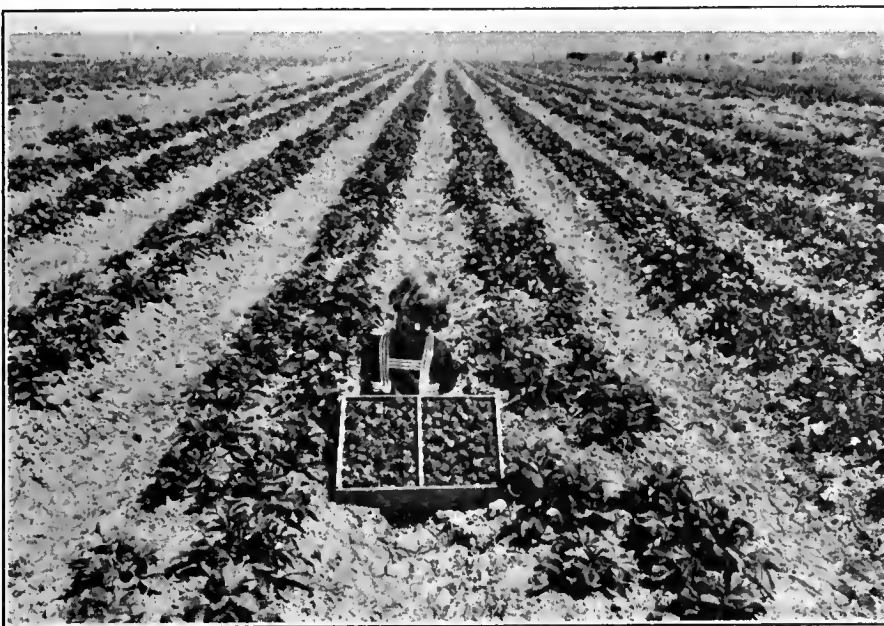
## Project Women's Caches

Ask the housewife about her home and among the things she will speak about with pride will be her closets. The more she has of them the better she likes it.

### CLOTHES CLOSET

This may be of good serviceable size but if not properly arranged will miss its very purpose. By all means install a horizontal rod (preferably round) on which each garment may be hung on an individual hanger. It is surprising how many garments may be accommodated, and an added advantage of this arrangement is its neat appearance.

On the inside of the door of the closet tack a holder for bedroom slippers. Attractive ones may be made of cretonne—just a straight piece turned up and sewed off into pockets.



Imperial Valley strawberries—money-makers

### LINEN CLOSET

"A place for everything and everything in its place" is a particularly fitting remark for this treasure chest. The convenience of the family is involved as well as the earmarks of a good housewife. After the linen closet is once established it is a very easy matter to maintain in order. Only the woman who enjoys one can tell you what pleasure it is to carry the week's laundry to the closet and distribute bedding, towels, wash cloths, etc., each in its own place.

### Try These

Miss R. C. Watkins, of the Washington office force, offers the following for a trial in project homes:

#### ORANGE MARMALADE

2 good-size oranges. 12 cups of water.  
2 good-size lemons. 4 pounds of sugar.  
Run oranges and lemons through chopper. Add water and let boil one hour. Then add sugar and boil until jellied—about one hour. (Makes 7 glasses.)

#### OLD FASHIONED "MOTHER'S" CAKE

1 cup of butter. 1 teaspoonful of yeast powder.  
2 cups of sugar. 1 teaspoonful nutmeg (or other flavoring).  
3 cups of flour (sifted). ¼ teaspoonful salt.  
1 cup of milk.  
5 eggs.

Cream butter and sugar, beating until very light. Add sugar, and cream again. Beat separately yolks of eggs and whites of 3 eggs. Add to butter, and cream again. Add milk, flour, salt, yeast powder, and flavoring.

#### ICING

Whites of 2 eggs (remain- 2 cups of sugar.  
ing from above). ½ cup of water.

Boil sugar and water until it forms a ball in cold water. Beat whites of eggs very stiff and to these add the boiled sugar. Beat until cool. Add lemon (or other flavoring).

### Wanted

A good, tried recipe for preserved water-melon rind.

## Household Hints

Tablecloths and napkins will last longer if when ironed they are folded in three parts one week and four the next ironing.

To clean a chamois, soak thoroughly in warm water, spread over a smooth hard surface, and rub a good "scrubbing soap" over its surface from the center to the edges and see the dirt rub out.

Rub soap under the finger nails before blacking the stove and none of the blacking will work under the nails.

If a drawer runs unevenly and causes trouble in opening and shutting, it is not always necessary to have recourse to the carpenter. Frequently the very simple method of rubbing a little soap on the inner edges of the drawers will overcome this difficulty.

## Cream Pool Established Recently on the Minidoka Project, Idaho

*Operated by the Mini-Cassia Dairyman's Association, this cooperative organization to establish a more direct relationship between producers of cream and consumers of butter gives promise of a successful future*

*By E B Darlington, Superintendent, Minidoka project*

A COOPERATIVE organization which promises to have an important influence in the economic life of the community was established recently on the Minidoka project, in southern Idaho. The new venture is a cream pool, which is being operated by the Mini-Cassia Dairyman's Association, a mutual alliance representing a membership in both Minidoka and Cassia Counties, which lie on opposite sides of Snake River and are in large measure united agriculturally within the boundaries of the Minidoka Federal irrigation project.

The movement toward cooperation among local dairymen started about four years ago, but it was during the sessions of a dairy school held at the village of Declo last January that it crystallized into activity as a live organization determined to enter the business field. On June 7 a receiving station was opened and a program of collecting cream was inaugurated.

The objects of the association are to establish a more direct relationship between the producers of cream and the consumers of butter, to reduce overhead charges in manufacture and to obtain for the membership any advantages that the market may afford. It is believed by the members that they will be able, through handling of the cream on their own account and the sale of butter through their marketing organization, to secure to themselves the profits on butterfat that have been going to outside concerns.

### SIX COLLECTION ROUTES

Headquarters of the pool are at Burley. From this central point, trucks are sent out to collect cream from the farmers and it is all brought into the station for testing, cooling, grading, and preparation for shipment to the creamery at Jerome, about 50 miles away, where for several years a cooperative establishment has been operated. The cream collected and prepared locally is sent by truck daily to the Jerome creamery, the product of a collecting station at Eden being picked up en route. There are six collection routes out of Burley, with three trucks covering the territory.

The plan adopted by the association is to have the truck drivers call for separated cream on half the patrons each day, so that all members will have an opportunity to forward their product every other day, including Sundays during hot

weather. Payment for the cream is made upon the next visit following the delivery or at the headquarters station, on an advance price basis determined upon the existing market and the outlook. Adjustments in price are made monthly, according to actual receipts for butterfat by the association. A premium of 3 cents per pound of butterfat is paid for sweet cream and the farmers are urged to keep it sweet, for the maintenance of high butter standards. Butter is sold at sour cream prices to the farmers who are shipping, or 3 cents off the sweet cream price.



A contributor to the pool

On June 15 more than 1,600 cows were signed up for the pool, but not all of them were contributing, on account of delays encountered in making final arrangements. Hay harvest was on and it has been impossible for all members to establish themselves immediately upon the new basis, requiring additional equipment in the way of separators, containers, etc. However, the average daily shipment to the Jerome creamery for the first month of operation is estimated to be from 800 to 1,000 pounds and it is believed that by the end of the summer the output of the Burley station will be at least 30,000 pounds of butterfat per month.

The membership in the Mini-Cassia Association now numbers about 260 dairymen. A development in the next few months to about 350 members, with upwards of 2,000 cows contributing, is expected by the officers and directors of the pool.

### JEROME CREAMERY HANDLES PRODUCT

The arrangement by which the new organization has its product manufac-

tured into butter at the Jerome Cooperative Creamery and marketed from there is considered advantageous from the standpoint of both the dairymen and the creamery administration. The association has taken a single share in the Jerome Cooperative, and is accorded exactly the same treatment as if each individual member were a shareholder. The creamery pays the cost of collecting, testing, cooling, grading, and hauling the cream, and the salary of the manager of the Burley station, on the theory that the largely increased volume from this locality reduces the unit overhead cost. It is planned to operate the Jerome creamery at night to handle the additional input. The Jerome establishment already produces 175,000 pounds of butter per month and has the second largest volume of any creamery in the State.

The butter from the Jerome creamery, including that manufactured for the Mini-Cassia Association, is marketed through the Challenge Butter Association, of Los Angeles, which is owned by 15 cooperative creamery associations and absorbs practically the entire product of all of them. Because of the high standards maintained by this marketing organization and required of its contributors, it is able to obtain a price for sweet-cream butter several cents in advance of the general market in southern California.

### OVERHEAD COSTS REDUCED

By handling the large volume through the Jerome creamery, partially supplied by Minidoka project dairymen, it will be feasible, according to local officials, to reduce the proportion of overhead costs so that the cream producers can be paid at least 2 cents per pound more for butterfat than the market price of butter at Los Angeles. This is possible because of the overrun in finished butter weight as compared with the poundage of butterfat.

A great deal of the milk from project dairy herds has been going to the cheese factories, there being five of these institutions in the community. Four of them are owned by the Laab interests and one is a cooperative plant. The cream pool will probably make inroads upon the business of these establishments and there will doubtless be a strong competitive market for dairy products hereabouts for some time.

# Contract Between United States and King Hill Irrigation District

## Under the Fact Finders' Act

**T**HE contract referred to above is dated March 2, 1926. After certain explanatory recitals, stating the history of the contract relations between the United States and the district, Articles 5, 6, and 7 obligate the district to make payment of the construction charges on the crop return basis, as permitted by the act of December 5, 1924 (43 Stat. 672), commonly referred to as the fact finders' law. Because of the interest attaching to these three articles, as a concrete application of the fact finders' law to the King Hill project, they are here copied in full, as follows:

### REPAYMENT TERMS

"That in lieu of the terms of payment provided for in said original contracts applicable to the construction charges payable by the district to the United States, said construction charges shall hereafter come due in the following installments and upon the following terms and conditions:

"(a) On December 1, 1928, and on December 1 of each year thereafter, the district will pay to the United States an annual construction charge which shall be determined by multiplying the average rate per acre (as announced and determined by the Secretary) by the number of irrigable acres of land in the district subject to construction charges as the said number of acres is announced and determined annually by the Secretary.

"(b) The average rate per acre to be used in determining the annual construction payment to be made to the United States by the district will be 5 per cent of the average gross acre-income (as determined by the Secretary) of the area of irrigable land in cultivation in the district for the 10 calendar years first preceding the year in which such installment comes due as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive.

"(c) For the purpose of determining the annual construction payment to be made by the district to the United States, all the irrigable lands in the district are considered to be in one class, but it is agreed that the district, if it so desires, may classify the lands of the district and upon the approval of such classification by the Secretary may collect annual construction assessments at different rates per irrigable acre from the lands of the various classes, but the annual construction payments to be made by the district to the

United States will not be changed by such classification. Should the district decide to make the land classification provided for herein, the district may have the use of the Government records in regard to land classification, and also the Government records in regard to crop returns from the various farm units in determining the proper rate of construction assessment applicable to each class of land.

"(d) In determining the number of irrigable acres of land in the district subject to construction charges for use in determining the annual construction payment to be made by the district to the United States, the Secretary may determine the number of irrigable acres in said district, which in his judgment can be properly irrigated with the water supply available for said project, and the number of acres so determined by the Secretary to be the number which can be properly irrigated with the water supply available on said project will be used as the number by which the average rate per acre will be multiplied in determining the annual construction payment to be made by the district, but such determination as to the number of irrigable acres subject to construction charges may be modified by the Secretary from year to year as he shall find conditions warrant.

"Construction payments on the basis above set out shall continue from the district to the United States until the construction indebtedness of the district to the United States as determined by said original contracts has been fully paid, plus any amounts added to said construction indebtedness (a) on account of interest or penalties; (b), in analogy to the method fixed in subsection L of section 4 of the said act of December 5, 1924, by which any due and unpaid construction, or operation and maintenance charges and penalties are added to the unaccrued and unpaid construction charge to ascertain the new total construction obligation."

### FUNDING INDEBTEDNESS

The contract provides for the keeping of crop records by the district, and for the checking of these records by the United States. The contract, as permitted by the fact finders' law, allows the delinquent charges due from the district to be added to the unaccrued and unpaid construction charges, thus in effect funding the due and unpaid indebtedness of the district to the United States.

The district is to make no substantial change in the project works, which are to be operated and maintained by the district, unless the Secretary of the Interior consents to such change. The annual construction payments are made semi-annually on December 31 and on July 31, these payments being fixed at such dates as will allow the district to secure the monies when paid by the individual water users in meeting their taxes, and to turn over to the United States the money due the Government.

### OPERATION AND MAINTENANCE CHARGES

The board of directors of the district are authorized to determine the amounts of the annual operation and maintenance charges payable by the water users owning land in the district. The district must require payment of the operation and maintenance charges in advance, this being enjoined by subsection N of section 4 of the fact finders' act.

The Secretary of the Interior has the option, under the contract, to retain the operation and maintenance of the headworks of the main canal, in which event the district is to pay the United States the cost incurred by it in connection with the headworks. The United States is to be under no obligation to furnish any water for the lands of the district if the district is delinquent in the payment of any charges due the United States, and in case of breach of the contract by the district the contract may be canceled upon one year's notice to the district.

The Secretary is empowered to make inspections of the transferred works from time to time, and the cost thereof and of any repairs that he may require is to be borne by the district.

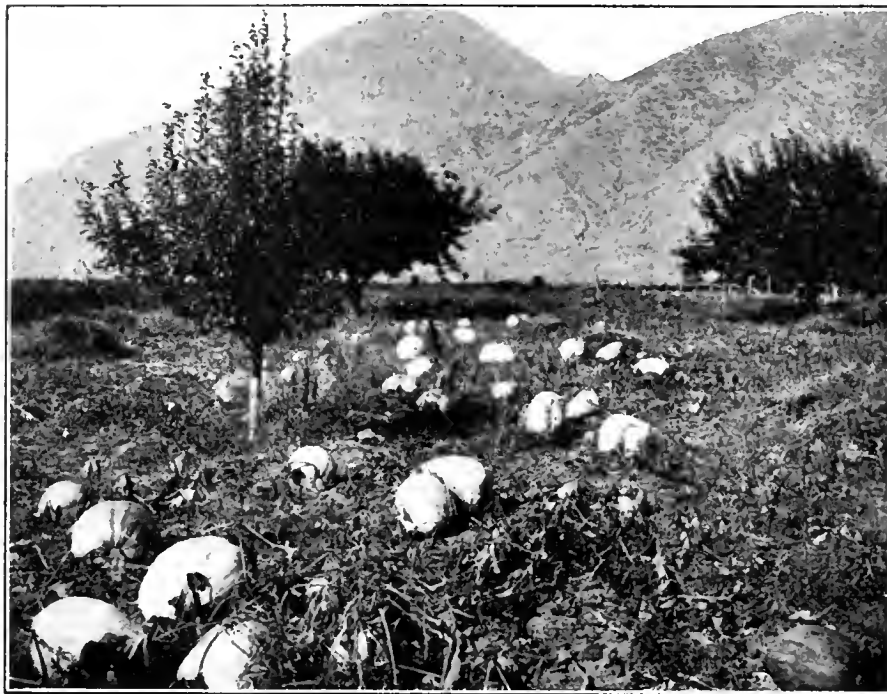
**A** COMMITTEE from the Portland and Oregon State Chamber of Commerce visited the Unatilla project recently with a view to aid in settlement. They were guests of the various commercial clubs and were favorably impressed with the future possibilities for development.

**C**OLLECTIONS during June on the Strawberry Valley project amounted to \$8,223.80, of which \$2,319.20 were construction charges, \$3,306.54 operation and maintenance charges, and \$2,598.06 power and miscellaneous collections.



## A Utah County Truck Farm

W. H. Olin, Supervisor of Agriculture, Denver & Rio Grande Western R. R. Co.



On the Mapleton Bench, Strawberry Valley project, Utah

**P**ERHAPS the best truck farm in all Utah County lies under the Strawberry Valley reclamation project. It is just a few miles out from Payson, Utah, in the south end of Utah County. As one approaches this farm he reads a farm sign by the roadside:

UTHNAGE TRUCK FARM  
DRIVE IN AND LOOK AROUND  
FRANCOM'S FAMOUS WATERMELONS

The writer was told that the farm is named after the place in South Africa where the owner—John H. Francom—was born.

The total area of this farm is 60 acres. Approximately 40 per cent of it is in alfalfa. The truck crops are in small areas but farmed most intensively. We question whether in all Utah there is to be found a more careful farmer who keeps up the quality of every truck crop as Mr. Francom does. Perhaps he is best known for his watermelons. He usually has 5 to 10 acres given to this crop. This year he has 7 acres. For a number of years it has been his custom to select carefully and mark by stake the most symmetrical melons, growing on thrifty sturdy vines, for his seed for the succeeding year. He will not sell these melons at any price,

but will let the visitor or guest at his farm eat the melon provided he places the seed of that particular melon in a receptacle

provided for the purpose. In this manner he has worked up a melon noted for its symmetry, choice flavor, and size. Although he could send carloads of these choice melons to market, he ships only a small portion of his crop. Why? Because his melon patch is so well known within its district that, from the near-by towns and mining camps people come by the hundreds on week ends, during melon time and buy his surplus to take home in their autos. His major market, therefore, is right at home on the farm.

### FAMOUS FARM PRODUCTS

His strawberries and raspberries are no less famous and find a ready market at Payson, Spanish Fork, Tintic, Springville, Provo, and Salt Lake City. This farm this season has 17 acres in berries.

Here also one finds the very choicest of Spanish sweet onions grown. This season Mr. Francom has 5 acres planted to this crop.

Utah's earliest table potatoes come from this truck farm. The writer saw 10 acres growing here with an almost perfect stand. Mr. Francom grows his own onion seed, so he insures getting the quality of table onions the market pays the best money to obtain. He sells some onion seed, but this is not a commercial crop with him. Like all crop farmers in this district, Mr. Francom has a field of sugar beets. This year he has only 4 acres planted, but he will get a tonnage from this field to obtain which the average sugar-beet farmer has to have double that acreage.

(Continued on page 139)



Part of the large crop of sugar beets grown on the Strawberry Valley project, Utah



## Notes From Our Projects 10 Years Ago

*From the Reclamation Record of August, 1916*

**T**HE Community Club of Mitchell, Nebr., entertained as guests at lunch June 7, Dr. Elwood Mead, chairman of the general board of review of the Reclamation Service, and Mr. Carl Slatt, of the Nebraska Farmers' Union. Both gave interesting addresses, Doctor Mead speaking particularly of the work that is being done by European countries in the way of rural credits, especially as it gives aid to the renter in helping him to become a landowner. He called attention to the fact that America has a larger percentage of tenant farmers than any other country in the world and that our own rural credit law does not extend help to this class, but is confined exclusively to the man who owns his land. One of the objects of Doctor Mead's visit was to get an intimate knowledge of the needs of the project in the line of rural credits.

The "sticking point" with many a farmer is his failure to get on with his neighbors; this has been true for centuries. One progressive county in this country has adopted the slogan "Get acquainted with your neighbor; you

might like him." In the writings of the ancient Romans we find this advice about neighbors:

"Be a good neighbor. Do not roughly give offense to your own people. If the neighborhood regards you kindly you will find a readier market for what you have to sell; you will more easily get your work done either on the place or by contract. If you build, your neighbors will aid you with their services, their cattle, and their materials. If any misfortune should overtake you (which God forbid) they will protect you with kindly interest."

The method of applying irrigation water to the soil is of prime importance to every irrigation farmer. Different soils require different treatment, and the selection of a right or a wrong method of applying the water may mean the success or failure of the farmer. A proper appreciation of the general principles of applying water will enable the water user to avoid many expensive mistakes and from the first secure all the advantages of irrigation farming.

As a general rule the method selected depends on a variety of conditions, such as topography or slope of the land, nature

of the soil and subsoil, texture of the soil, value of the land, climatic conditions, and the nature and value of the water right.

A number of improvements on the Minidoka project were put under way. A new railroad freight depot was built at Rupert and new tracks were laid. Contracts were let for the new courthouse at Rupert. It is reported that the Salt Lake & Idaho Railroad, now constructed from Burley to Marshfield, will be extended at once into the Raft River country.

The entire canal system of the Okanogan project was operated throughout the month, the project lands having been quite generally irrigated during the fore part of the month and throughout the hot spell, but the demand gradually decreased after the rains began and, at the close of the month, the canals were carrying only about one-half their capacity. The flood run-off of Salmon Creek reached the highest stage in the history of the project toward the close of the month and, the reservoir being flooded, it was necessary to run the entire flow down Salmon Creek and waste such portion of it as was not diverted by the canals of the project and other irrigation ditches. Some damage was done to roads and bridges.

### Utah County Truck Farm

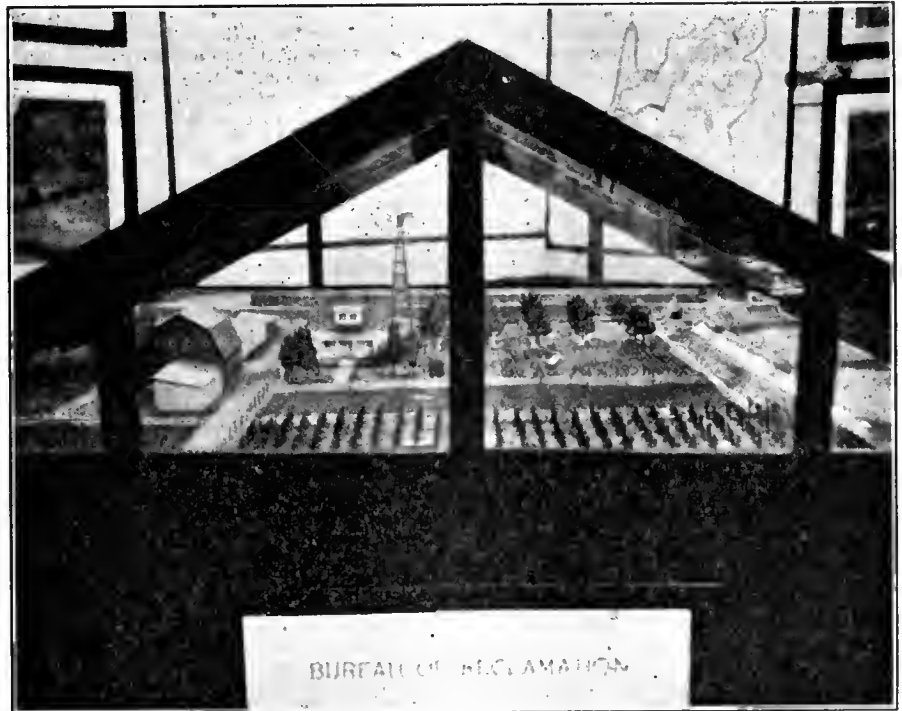
(Continued from page 138)

In smaller acreage one sees commercial crops of asparagus, rhubarb, horse-radish, bulbs, and miscellaneous garden and flower seeds being grown, along with choice and rare flowers for this farmer's own satisfaction and for the market.

Here is a Utah farm most carefully cultivated. It shows what fertility these Utah Valley soils possess, in one of the most delightful mountain environments one can desire.

Close to this farm live Mr. and Mrs. H. W. Gore. Mrs. Gore is chairman of the community life committee of the American Farm Bureau Federation, which has its headquarters office in Chicago. Mrs. Gore is recognized as one of the most valued farm workers on community farm life problems in this whole Nation. Her influence is felt and appreciated in this beautiful Utah valley.

The home seeker will do well to visit this district, where 40 acres make a good sized farm and 80 acres a big farm. Mr. Francom has set the pace, and this one valley can find place for at least 100 more with his energy, patience, and resourcefulness.



Model of irrigated farm. Part of the exhibit of the Bureau of Reclamation at the Sesquicentennial International Exposition, Philadelphia, Pa.

## Recent Federal Irrigation Legislation

Passed by the 69th Congress

### Rights of Way

**BE** it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 18 of what is generally known as the Irrigation Act of March 3, 1891, as amended by act of March 4, 1917, be, and is hereby, amended so as to read as follows:

"SEC. 18. That the right of way through the public lands and reservations of the United States is hereby granted to any canal ditch company, irrigation or drainage district formed for the purpose of irrigation or drainage, and duly organized under the laws of any State or Territory, and which shall have filed, or may hereafter file, with the Secretary of the Interior a copy of its articles of incorporation or, if not a private corporation, a copy of the law under which the same is formed and due proof of its organization under the same, to the extent of the ground occupied by the water of any reservoir and of any canals and laterals and fifty feet on each side of the marginal limits thereof, and, upon presentation of satisfactory showing by the applicant, such additional right of way as the Secretary of the Interior may deem necessary for the proper operation and maintenance of said reservoirs, canals, and laterals; also the right to take from the public lands adjacent to the line of the canal or ditch, material, earth, and stone necessary for the construction of such canal or ditch: *Provided*, That no such right of way shall be so located as to interfere with the proper occupation by the Government of any such reservation, and all maps of location shall be subject to the approval of the department of the Government having jurisdiction of such reservation; and the privilege herein granted shall not be construed to interfere with the control of water for irrigation and other purposes under authority of the respective States or Territories."

Approved, May 28, 1926. Public No. 302.

### Storage of Waters of the Pecos River

**BE** it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in accordance with the provisions of the act of June 17, 1902 (Thirty-second Statutes at Large, page 388), and acts amendatory thereof or supplementary thereto, except as the same are modified herein, the Secretary of the Interior is hereby authorized and empowered to construct the Red Bluff Federal Irrigation Project, consisting of a reservoir upon the Pecos River, sufficient in size for the irrigation of not exceeding forty thousand acres of land in the State of Texas, which reservoir shall be located at a point where it will impound the flood waters of Delaware Creek and Black River, and shall be pro-

vided with all necessary incidental works for the operation of the same.

SEC. 2. That no expenditure for construction shall be made under this act until an appropriate contract or contracts in form approved by the Secretary of the Interior, providing for the payment to the United States as provided herein of the costs incurred on account of said project, shall have been properly executed by a district or districts organized under State law and embracing property to be benefited by said project, and such execution shall have been confirmed by a court of competent jurisdiction: *Provided*, That expenditures may be made hereunder at any time to cover necessary expenses incurred by the United States on account of preliminary investigations and negotiations in connection with the execution of the contract or contracts provided for by this section.

SEC. 3. That the total cost to the United States of the construction of said project shall be repaid to the United States in twenty annual installments, without interest, as follows: Five per centum thereof on March 1st of the second year following the year in which water becomes first available from said reservoir for irrigation, and 5 per centum thereof annually thereafter until the whole amount is paid: *Provided*, That if any installment shall not be paid when due there shall be added at once to such installment a penalty of 1 per centum thereof and thereafter on the first day of each month a like penalty so long as the default continues.

SEC. 4. That the cost to the United States of operating and maintaining said project shall be paid to the United States in advance upon annual estimates made by the Secretary of the Interior, and upon a day to be fixed by him: *Provided*, That the cost of operating and maintaining the project the year water is first available therefrom for irrigation, shall be merged with and made a part of the construction cost. If the estimate for any one year shall be either more or less than the actual cost, an appropriate adjustment shall be made in the estimate for the next succeeding year.

SEC. 5. That no classification by the Secretary of the Interior of the irrigable lands of said project shall be required, nor shall he issue any public notice relating to construction charges against said lands: *Provided*, That the Secretary of the Interior shall determine the cost of said project, including the cost of operating and maintaining it the first season water is available therefrom for irrigation, and shall furnish a statement of such cost to the contracting district or districts.

SEC. 6. That there is hereby authorized to be appropriated from any moneys not otherwise appropriated, in the reclamation fund such an aggregate amount as may be necessary to carry out the purposes of this act, not exceeding the sum of \$2,000,000.

SEC. 7. In the event that any irrigation works are constructed under the authorization contained in this act,

neither the United States, the State of Texas, nor any of the parties for whose benefit said works are to be constructed shall at any time hereafter have or claim, or attempt in any manner to acquire, any right to the use in the State of Texas of any water which shall flow in the Pecos River, or any of its tributaries, in New Mexico at or above the Avalon Dam, except such of said water as may not at any time be used or diverted from or above said dam: *Provided*, That nothing in this section shall be construed to curtail the quantity of water to which present users in Texas may now be lawfully entitled: *And provided further*, That no construction under this act shall begin until the State of Texas, through legislative act, signed and approved by the governor of said State, shall have agreed to the provisions of this section.

Approved, June 18, 1926. Public, No. 404.

### Yuma Water Users Get Credit for Payments

**BE** it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior be, and he is hereby is, authorized and directed to credit the individual water-right applicants in the Yuma reclamation project and the purchasers of water rights in the Yuma Mesa auxiliary reclamation project, on the construction charges due under their contracts with the United States under the reclamation act and acts amendatory thereof and supplementary thereto, with their proportionate part of all payments heretofore made or hereafter to be made by the Imperial irrigation district, of California, under contract entered into under date of October 23, 1918, between the said district and the Secretary of the Interior: *Provided*, That lands in the Yuma Indian Reservation for which water rights have been purchased shall share pro rata in the credits so to be applied.

Approved, June 28, 1926. Public, No. 438.

### May Employ Engineers for Dam Consultation

**Resolved** by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized, in his judgment and discretion, to employ for consultation on the plans and specifications for any dam proposed to be constructed by the Department of the Interior, the services of not more than three experienced engineers, determined by him to have the necessary qualifications, without regard to civil-service requirements and at rates of compensation to be fixed by him for each, respectively, but not to exceed \$50 per day

(Continued on page 141)

## Benefits of the Warehouse Act To Project Water Users

**T**HE United States warehouse act is a law passed by Congress in August, 1916. It is applicable only to public warehousemen storing agricultural products. At this time the following products are storable under the law: Cotton, grain, wool, tobacco, farmers' stock or peanuts, late crop of potatoes, broom-corn, dry edible beans, dried fruit, and sirup (including cane and maple.)

### **BENEFITS FROM STORING IN FEDERALLY LICENSED WAREHOUSES**

The principal benefits which the farmer may expect to receive from storing his products in warehouses licensed under the United States warehouse act are:

1. A safe place for storage.
2. Weights and grades of his products determined by disinterested and competent persons.

### **Recent Legislation**

(Continued from page 140)

and necessary traveling expenses, including a per diem of not to exceed \$6 in lieu of subsistence for each engineer respectively, not exceeding in the aggregate more than \$3,500 for any engineer so employed for the time employed and actually engaged upon such work: *Provided*, That retired officers of the Army may be employed by the Secretary of the Interior as consulting engineers in accordance with the provisions of this act.

Approved, June 28, 1926. Public Res., No. 40.

### **Water-Right Charges and Liens Canceled**

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the Secretary of the Interior be, and he hereby is, authorized to cancel water-right charges of any and every kind in connection with the Buford-Trenton and Williston irrigation projects in North Dakota constructed under the act of Congress approved June 17, 1902 (Thirty-second Statutes at Large, page 388), and acts amendatory thereof or supplementary thereto, and to release or consent to the release of any and all liens however created and now existing against lands of said projects on account of said water-right charges.

SEC. 2. The Secretary of the Interior is authorized to do any and all things necessary to give full effect to the provisions of this act.

Approved, May 26, 1926. Public, No. 291.

3. As security for loans, the Federal warehouse receipts will make it possible for him to borrow on the loan value of his product rather than on his personal responsibility.

4. A larger amount of credit may usually be secured with a Federal warehouse receipt as security for the loan.

5. A larger field of credit upon which to draw is opened to the farmer by the use of Federal warehouse receipts.

6. If the farmer handles his credit problems properly, he ought to be able to obtain a lower interest rate than by the use of the ordinary warehouse receipt.

7. By storing products with federally licensed warehousemen, the farmer can feel assured that his products are in the hands of persons who know how to care for them and to prevent them from deteriorating.

8. Frequently the farmer can obtain a lower insurance rate on his products when stored in federally licensed warehouses.

9. If his farm is located at some distance from the shipping point and the roads between the farm and the shipping point are not improved, placing the products in federally licensed warehouses generally means having them at a point from which they can be shipped at any time of the year regardless of weather conditions, thus making it possible to

take advantage of desirable opportunities to sell.

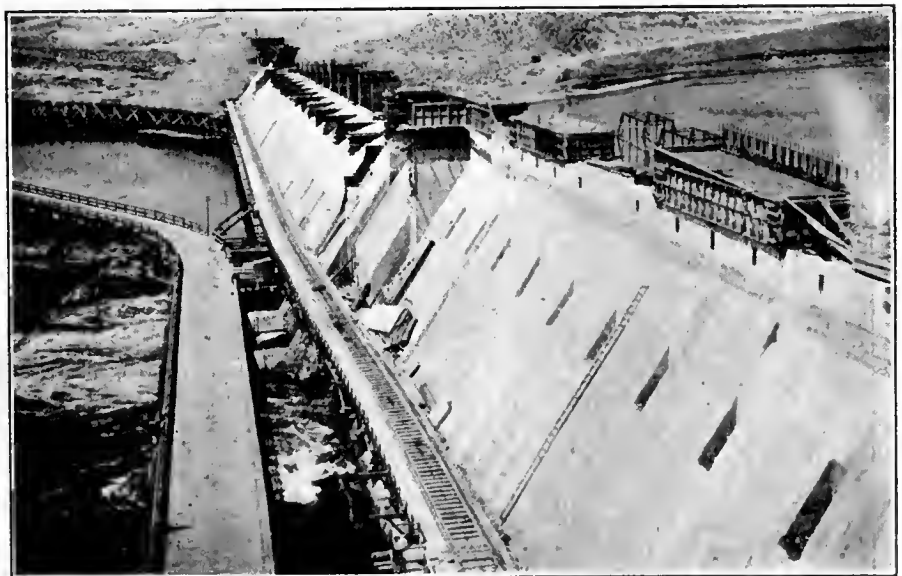
10. By storing in licensed warehouses, large quantities of products are accumulated at one point. This concentration of products creates a market point and attracts more buyers than usually operate where small quantities of products can be bought. The more buyers there are in a market the keener is the competition, with the result that usually better prices are paid.

11. By insisting on having the grade, condition, and weight of the stored products stated on the warehouse receipt, the farmer gets a fair idea of the value of his product. By consulting daily market quotations, he can then determine just what price is a fair selling price for his products.

### **UP TO THE FARMERS**

If the warehouseman in the community where the farmer takes his products for storage is not operating under the Federal law, and the farmer desires the benefit of this law, he should let the warehouseman know that if he wants his business the warehouse must be operated under the law. It rests with the farmer to say whether he shall have a warehouse receipt issued under the Federal warehouse act. *From Misc. Circ. No. 51, U. S. Dep't. of Agri.*

**A**N acre of cherries near Snnnyside, Yakima project, is reported to have yielded 10.5 tons of Bing cherries, 329 pounds of Lamberts, and 1,215 pounds of Black Republicans, the returns totaling \$2,424.58.



Construction progress at American Falls Dam, Idaho

## Organization Activities and Project Visitors

COMMISSIONER MEAD returned to the Washington office on July 21 after making a first-hand inspection of economic conditions on a number of the projects. He leaves for Haiti on August 10 to make an inspection of a proposed irrigation development.

H. J. Gault, formerly employed by the bureau, who for the past six months has been engaged on irrigation investigations in Mexico with a private concern, was reinstated in the Denver office effective June 30.

C. C. Elder, assistant engineer, who has been at Kilgore, Idaho, in charge of the Dubois secondary investigations, has returned to the Denver office.

C. H. Howell, engineer in the Denver office, has resigned to accept a position with the middle Rio Grande conservancy district.

S. B. Shannon and N. Shand, engineers from the irrigation department of the South African Government, who are visiting this country for about a year, and who wish to get a working familiarity with the way our irrigation projects are run and the manner in which farms are cultivated, were visitors at the Denver office recently.

Miss Avola Hendrix, underclerk on the Yuma project, resigned recently.

Elie Aghion, of Alexandria, Egypt, who is interested in irrigation agriculture, was a recent visitor on the Yuma and Rio Grande projects.

A. C. Cooley, director of farm demonstrations on reclamation projects, inspected the gravity division of the Grand Valley project on June 30. Mr. Cooley had attended the divisional conference of extension agents at Delta, Colo., and visited the project en route to his headquarters in Salt Lake City.

The American Falls Dam was visited recently by Carl Gray, president, and other officials of the Union Pacific Railroad, and by Barry Dibble, former superintendent of the Minidoka project.

Miss M. E. Scully, clerk at American Falls, has been transferred to the office of the district counsel at Boise.

Among the recent visitors to the Milk River project was L. C. Gilman, vice president of the Great Northern Railway.

Messrs. Baughman, of the Federal land bank at Wichita, Kans., and of the Drover Stock Bank at Denver, visited the Uncompahgre project recently to look over the project lands relative to the adoption of a policy of making farm loans thereon.

J. G. Marr and A. T. Mitchelson, irrigation engineers of the Bureau of Roads Department of Agriculture, visited the Minidoka project during June to study moss-removal operations.

State Engineer George M. Neel was on the Carlsbad project the latter part of June in connection with matters pertaining to Black River.

Visitors to McKay Dam during the month included a delegation from the Portland Chamber of Commerce, who were interested particularly in obtaining settlers for that part of the State.

Fiscal Inspector C. A. Lyman is in the Washington office in connection with fiscal adjustments on the projects.

R. J. Coffey, district counsel, spent several days on the Klamath project



Preparing land for crops on the Belle Fourche project, S. Dak.



in connection with project matters and holding a hearing to obtain evidence for the Government in regard to the exclusion of the Enterprise Land & Investment Co. lands from the Klamath irrigation district. B. E. Hayden, industrial agent, and I. S. Vorhees, of the California State Highway Department and formerly with the bureau, were called as witnesses.

Miss Margaret Regan, junior clerk, Sun River project, resigned at the close of business June 10. Maryden Dahlstrom, junior clerk, reported June 21.

Superintendent D. S. Stuver, Newlands project, visited Reno recently to confer with Harry C. Dukes, Truckee River water master, in regard to the administration of the tentative decree in relation to the project water supply.

Recent visitors on the Klamath project were C. H. Pease, editor of the Delta Irrigation News, McAllen, Tex., and Mr. Rohrer, county road supervisor of Siskiyou County, Calif.

Hon. Desire Pasquet, of Paris, France, spent several days on the Yakima project during the latter part of June.

## Unused Land to Be Investigated

*Investigation into the development of arid, semiarid, swamp, and cut-over lands, under an appropriation of \$15,000 made available on July 1, 1926, in the 1927 Interior Department appropriation act, will be conducted on a cooperative basis with the States.*

*Commissioner Mead states that four States—North and South Carolina, Georgia, and Mississippi—have already indicated a desire to enter this cooperative arrangement. Other States are requested also to cooperate in the investigations. The first step, as proposed by the Reclamation Bureau, is to determine where tracts of land can be found which are suitable for reclamation and settlement. Colonies for farmers can then be established upon them under a definite agricultural program. These tracts should be large enough to permit the settlement of 100 to 200 families and should comprise 10,000 to 30,000 acres.*

*Information regarding the location of available areas, possible prices for land, and suitability for such development are solicited by the Bureau of Reclamation.*

R. K. Cunningham, chief clerk, and P. M. Wheeler, bookkeeper, of the Yakima project, visited the Ellensburg office, Kittitas division, to assist on accounting procedure, following the previous transfer of the Kittitas accounts from the Yakima to the Ellensburg office.

H. A. Glen, district freight agent of the Northern Pacific Railroad, called at the Ellensburg office, Kittitas division, to discuss freight rates on construction materials.

Karl F. Keeler, former engineer of the Strawberry Valley Water Users' Association, has been appointed in the Bureau of Reclamation and assigned to the engineering division of the Washington office.

Oscar P. and Mary E. Y. Thornton, of Somerton, Ariz., water users on the Yuma project, called at the Washington office on July 21. Somewhat appropriately and with a desire to please our visitors in every way, this was the hottest day so far recorded this year in Washington, the temperature rising to 104° F. and equaling that of Yuma itself on the same day. Mr. and Mrs. Thornton were traveling by auto and were planning to visit the Sesquicentennial Exposition in Philadelphia.



Cutting a heavy growth of alfalfa on the Carlsbad project, N. Mex.



## Delinquent Water User not Entitled to Service

Russell Holmes and his wife filed suit in the Superior Court for Okanogan County, Wash., against the Whitestone Irrigation & Power Co. for damages alleged to have been sustained as the result of failure of the company to furnish water for the irrigation of their lands. From a judgment for the defendant, plaintiffs appealed. In an opinion filed March 29, 1926, affirming the judgment of the lower court, the Supreme Court of Washington, said (244 Pac., 579)—

"The court having found that appellants were delinquent in the matter of the payment of their bills for water theretofore used, we think the right to refuse to supply further water was one that can properly be exercised as it was in this case, no matter what rights the public generally may have to require such service. No user of water can refuse to pay his delinquent bills and still demand service."—*R. J. C.*

**D**URING the month an additional application was received for a farm on the Riverton project. Three applicants appeared before the examining board, but action on their applications was suspended temporarily, and no additional farms were assigned.

## The Newlands Project In the Dairy Field

At a recent dairy field day held in Washoe County, near Reno, Nev., it was brought out forcibly that the Newlands project has a remarkable opportunity in dairying on account of its strategic location in relation to the strongest dairy product market in the world. The project can grow at low cost abundant crops of alfalfa, the most important dairy ration, and market the products at San Francisco, the highest market for butterfat in the world. San Francisco occupies this unique position because the population of the Pacific coast is growing at such an accelerated rate that dairy production can not keep pace, and because the per capita consumption of dairy products is ever increasing, owing to the activities of the various organized agencies working for the promotion of the dairy industry. California's butter consumption in 1925 was 94,492,798 pounds, of which only 73,599,667 pounds were produced within the State. Logically, Nevada and the Newlands project are in a better position, by virtue of contiguous location, than any of the competitor States to supply the California deficiency.—*D. S. Stuver, superintendent, Newlands project.*

## Nevada Supreme Court Finds Contract Valid

The Truckee-Carson Irrigation district under date of January 22, 1921, entered into a contract with the United States by which the United States agreed to expend a maximum of \$700,000 toward the drainage of the district lands, which comprise a portion of the Newlands Federal reclamation project.

Statutory proceedings to confirm the contract were brought and upon appeal to the supreme court of the State the court (April 5, 1926, 245 Pac. 285) upheld the constitutionality of the Nevada irrigation district law and confirmed the proceedings, finding the irrigation district to have been duly organized and the contract to be valid. The court also upheld the power given to the district by a State statute to assess high lands for drainage charges when such high lands contributed to the seeped condition of the lower lands of the district. It was also held that drainage assessments might be levied at a flat rate, if the district board found as a fact that the benefits to the land in the district were equal.

A better class of farm laborers could be attracted by offering steadier employment.

### COMPARATIVE COLLECTIONS ON THE RECLAMATION PROJECTS

State	Project	Construction				Operation and maintenance			
		May, 1925	May, 1926	Fiscal year 1925 to May 31, 1925	Fiscal year 1926 to May 31, 1926	May, 1925	May, 1926	Fiscal year 1925 to May 31, 1925	Fiscal year 1926 to May 31, 1926
Arizona.....	Salt River.....			\$599,326	\$643,862				
Arizona-California.....	Yuma.....	\$2,296	\$1,716	351,672	341,928	\$5,810	\$2,368	\$363,647	\$224,724
California.....	Orland.....	1,880	2,155	35,222	81,654	634	976	26,361	35,133
Colorado.....	Grand Valley.....	(1)	(1)	(1)	(1)	4,079	2,059	40,740	64,359
	Uncompahgre.....	181	6,586	25,122	120,127	778	6,671	75,527	136,525
Idaho.....	King Hill.....							71	161
	Mimodoka:								
	Gravity.....	1,275	16,807	61,586	150,037			12,639	31,407
	Southside pumping.....	148	314	30,507	71,068	240	6,215	36,426	53,585
	Jackson Lake.....		80	31,970	40,062	2,603	10,208	14,859	15,956
Idaho-Oregon.....	Boise.....	27,751	9	224,750	118,601	13,044	750	103,982	133,489
Montana.....	Huntley.....	1,839	4,643	18,964	27,789	4,553	3,938	31,465	34,804
	Milk River.....	(1)	(1)	(1)	(1)	1,526	1,856	15,274	17,875
	Sun River:								
	Fort Shaw.....	467	898	7,553	7,564	426	518	7,351	7,489
	Greenfields.....	(1)	(1)	(1)	(1)	3,008	2,116	13,824	15,656
	Lower Yellowstone.....		1,121	3,350	13,968		2,448	5,221	20,051
Montana-North Dakota.....	North Platte:								
	Interstate.....	316	7,234	25,149	31,877	2,718	1,035	44,335	46,504
Nebraska-Wyoming.....	Fort Laramie.....	(1)	(1)	(1)	(1)	22,939	2,987	57,692	36,153
	Storage.....		500	31,989	20,790			12,653	4,558
	Northport.....							22,748	25,881
Nevada.....	Newlands.....	1,038	711	39,879	54,272	6,103	1,967	99,693	120,508
New Mexico.....	Carlsbad.....	577	686	67,097	47,322	638	594	64,476	37,666
New Mexico-Texas.....	Rio Grande.....	8,365	2,967	199,601	219,644	9,328	49,018	211,091	146,701
North Dakota.....	Williston.....			5,730	417	1,746		5,706	5,002
Oregon.....	Umatilla.....			61,320	35,717		617	17,579	40,215
Oregon-California.....	Klamath.....	1,313	1,482			8,661		58,428	39,694
South Dakota.....	Belle Fourche.....						39,694		31,496
Utah.....	Strawberry Valley.....	2,302	2,244	70,393	103,532	604	551	25,074	31,956
Washington.....	Okanogan.....			1,068	5,234			3,998	
	Yakima:								
	Sunnyside.....	1,455	1,103	57,319	161,924	14,860	10,152	85,375	159,645
	Tieton.....	14,780	4,163	144,041	173,998	8,193	1,223	88,229	83,170
	Storage.....	32,500	6,330	57,935	88,305			20,577	17,886
Wyoming.....	Shoshone:								
	Garland.....	182	4,463	9,870	29,902	2,320	2,107	16,437	36,800
	Frannie.....	(1)	(1)	(1)	(1)	1,621	2,001	7,494	6,981
Total.....		98,665	65,212	2,161,413	2,589,648	116,632	152,126	1,534,952	1,652,093

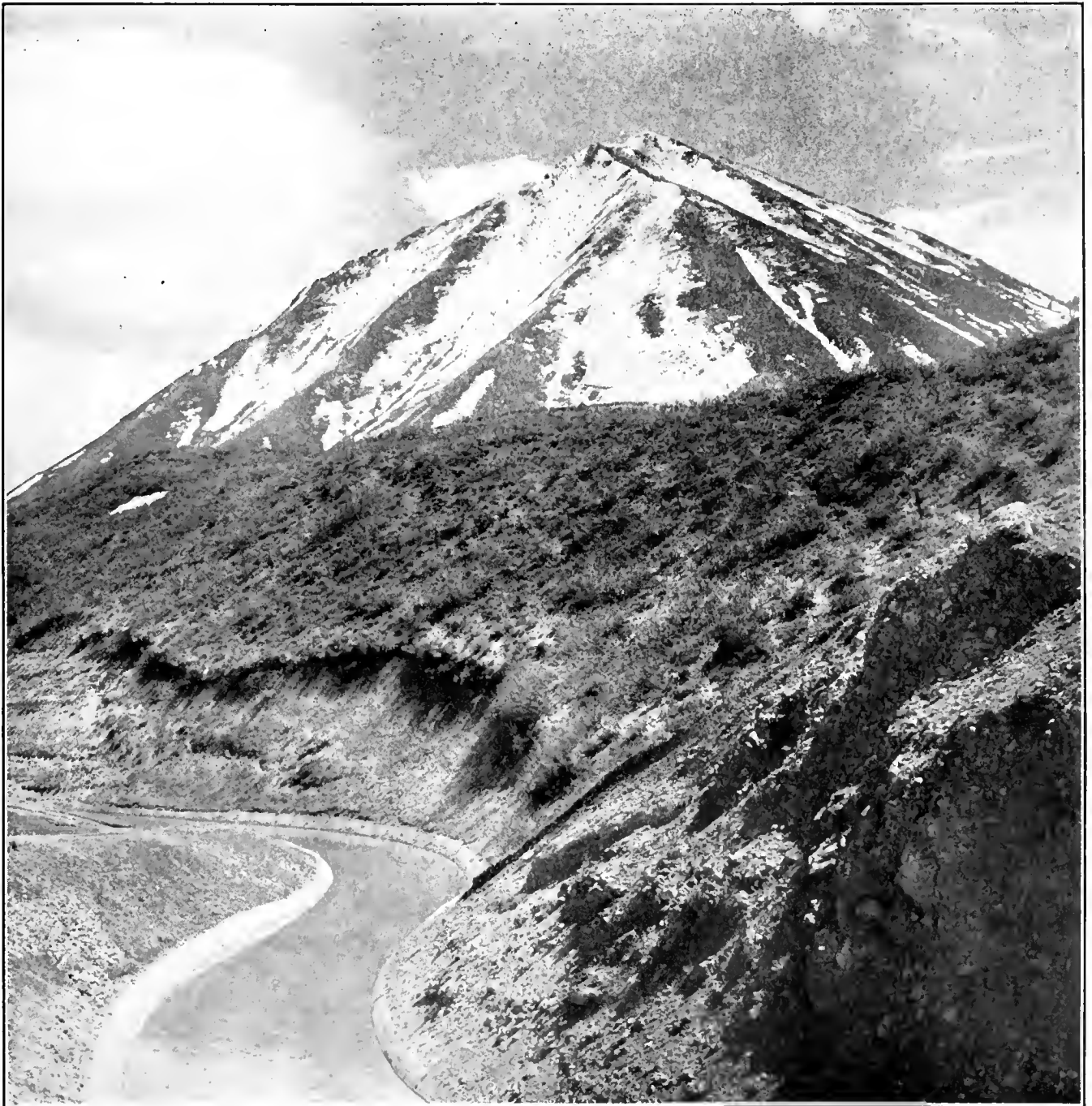
<sup>1</sup> Projects on water-rental basis.

# NEW RECLAMATION ERA

VOL. 17

SEPTEMBER, 1926

NO. 9



HIGH LINE CANAL AND SPANISH PEAKS, STRAWBERRY VALLEY PROJECT, UTAH

## *Land Utilization*

***I**N 150 YEARS this country has grown from a population of 3,000,000 to 116,000,000, has occupied about all the land that is attractive for rainfall farming, and has accumulated a wealth estimated at one hundred billion dollars, largely originating from the soil.*

*It is estimated by the National Bureau of Economic Research that our population gained 1,629,000 during the past year; the natural increase is about 1,500,000 native population, and the immigration laws permit the entrance of about 500,000 more. On this basis it has been estimated that there will be a population of 150,000,000 people in the United States by 1940. On the other hand, the total land area is fixed and is slightly less than two billion acres. Of our total land area, statistics show 50.2 per cent in farms, 26.4 per cent is classed as improved farm land, and 20 per cent is in crops. It is estimated that the potential use will ultimately increase the tilled area by irrigation 1.6 per cent. Ex-Governor Campbell, of Arizona, has recently estimated that less than 1 per cent of the present agricultural production of the country is from irrigated areas under the Federal Government. The total ultimate increase in the productive area is estimated at 8.8 per cent, so that within the next decade or two we are going to need all our good land, and we will need to proceed with an orderly program of national reclamation if this is to come about and if we are to remain a self-supporting nation.*

*—From the Quarterly News Letter of the  
Oregon Reclamation Congress.*

# NEW RECLAMATION ERA

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Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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## *Interesting Highlights on the Reclamation Projects*

**T**HE Yuma project reports that the highest yield this year of alfalfa seed is 345 pounds an acre, which at 14 cents a pound would give a return of \$48.30. In addition, the acre yielded 1 ton of straw at \$4 and three cuttings of hay amounting to \$27, giving a grand total of \$79.30 an acre, which is about equal to the returns from an acre of cotton.

**A**S an experiment and as a possible source of additional revenue, approximately 150 acres of head lettuce have been planted on Grand Valley project land from which potatoes have been harvested. It is believed that shipments can be made at a satisfactory price during October and November.

**S**HIPMENTS of agricultural products from the Yuma project during July amounted to 101 cars, valued at \$51,800. Since the first of the year 1,898 carloads of such products have been shipped, valued at \$1,544,850.

**A**RROWROCK Reservoir on the Boise project contained 68,320 acre-feet of water at the end of July. The flow of the Boise River reached the low stage of 1924, but showed an improvement at the end of the month.

**C**ONSTRUCTION work on the tie line from the Lahontan power plant, Newlands project, to Virginia City, Nev., is being pushed actively by the Nevada Valleys Power Co. It is expected that this tie line will be completed early in September.

**A**T McKay Dam, Umatilla project, all concrete in the parapet wall was poured during the month, and work was in progress on the installation of the spillway gates and lifting devices.

**T**HERE was a heavy draft upon Jackson Lake, Minidoka project, during July, the storage supply at the reservoir diminishing from 488,550 acre-feet on the 1st of the month to 145,010 acre-feet on the 31st. Practically all the remaining storage belonged to canals in the upper valley. American Falls Reservoir was of valuable service in regulating the river flow.

**T**HE total bank deposits in the five banks on the Minidoka project at the end of June amounted to \$2,005,600. The Burley banks showed an increase of practically 50 per cent over the record of a year ago. Tax collections in both Cassia and Minidoka Counties show marked improvement over those of last year. There has also been a pronounced reduction in delinquencies in both counties.

**F**ROM 4 acres of 3-year-old Thompson Seedless grapes grown on the Yuma Mesa, the returns from 4,600 pounds were \$103 an acre f. o. b. car at Yuma.

**A**T American Falls Dam, Minidoka project, 23,330 cubic yards of concrete were poured during July. About 13,400 cubic yards of earth were placed in the right embankment and sprinkled and rolled.

**F**RANK McCULLOCH, of Fernley, Newlands project, has the largest single field of cantaloupes ever planted in Nevada, the field containing approximately 120 acres in a solid stand of Hearts of Gold cantaloupes.

**T**HE Squire-Dingee Pickle Co., Belle Fourche project, has increased the number of vats until the Nisland station is now the largest pickle-salting center in the world, with a capacity of 50,000 bushels.

**A**T Guernsey Dam, North Platte project, 7,525 cubic yards of rock from the north spillway were placed in the downstream slope and 1,589 in the upstream slope. Work on the dam fill progressed steadily, 60,258 cubic yards of sluiced gravel and 8,570 cubic yards of selected material being placed. Based on gross contract earnings, the dam was 70 per cent completed at the end of July.

**T**HE Fallon sugar factory, Newlands project, has been purchased by local capital with the expectation of operating in 1927. The enterprise is reported to be amply financed, and the fact that some of the largest local landowners on the project are financially interested in the enterprise gives rise to the belief that the prospect for reestablishing the sugar industry on the project on a permanent basis is encouraging.

**T**HE season on the Yakima project has been unusually well advanced, and shipments for July were almost double those for the same month last year. This is particularly encouraging in view of the anticipated shortage of water later in the season.

**T**HE Powell Creamery, Shoshone project, purchased 16,500 pounds of butterfat during July and manufactured 19,100 pounds of butter and 1,300 gallons of ice cream. Other agencies purchased 3,800 pounds of butterfat. The price per pound for butterfat was 32 cents in sour cream and 50 cents in sweet cream.

**A** HEAVY rainfall at Yuma and vicinity on August 2, amounting to 2.12 inches in an hour and five minutes, did considerable damage to project works and to some farms. Picacho and Unnamed Washes demonstrated their usefulness in reducing the amount of damages and the amount of time in getting water back into the canal to serve crops below.

## Confidence and Optimism Replace Discouragement and Low Morale

*Commissioner Mead files comprehensive report with Secretary of the Interior, presenting first-hand views on economic conditions on the projects visited by him during a recent trip*

**T**HE discouragement and low morale which recently existed on some of the Federal reclamation projects in the West have been supplanted by a spirit of confidence and optimism, according to a detailed special report made recently by Reclamation Commissioner Elwood Mead to Secretary Work of the Interior Department.

Commissioner Mead declared that the gloomy attitude prevailing in the past has disappeared and that water users' organizations on the various projects were ready to cooperate with the Government in any constructive program for improvement of conditions. His report to the Secretary follows in full:

HON. HUBERT WORK,  
Secretary of the Interior.

DEAR MR. SECRETARY: On July 21 I returned to Washington from a five-weeks' visit to reclamation projects of the Northern and Pacific Coast States, covering much the same territory embraced in your visit of last year.

The outstanding impression of the inspection just completed is the remarkable change in the attitude of the people on reclamation projects, both with regard to their own prospects and their relation to the Interior Department and the Bureau of Reclamation. Last year was noted for the low morale on a majority of the projects visited. There had been four moratoriums in payments, which had not relieved the people of their debt, but had increased the amount of the payments which would be required in the immediate future. There was uncertainty as to whether settlers would be relieved from the payment of charges on land which had proven to be unproductive, their apprehension being based on the language of the reclamation act which required the entire cost of a project to be repaid.

This anxiety and apprehension were aggravated by the fact that the general agricultural depression had made it difficult for them to meet their individual obligations, without being called upon to pay those of anyone else. It was true, at that time, that a commission was engaged in gathering information as to the ability of settlers to pay, and the bureau was making a scientific study of the soils of different projects to determine the areas of fertile and productive land, but no one could forecast what the conclusions would be or what action Congress would take.

The result was not only a gloomy attitude on the part of water users, but in many cases very bitter feeling toward the Interior Department and the Reclamation authorities. This was not improved by the fact that in order to check a tendency toward repudiation, manifest on some projects, it was necessary for both you and myself, wherever in contact with settlers, to call attention to their obligations and the necessity for keeping faith with the Government as the only means by which reclamation would be justified and the reclamation policy continued.

*"A new spirit of confidence has supplanted the old feeling of discontent and distrust which has existed for many years. Settlers have entered into the cultivation of their farms with renewed vigor, and indications are that the largest crops on record will be produced during the coming season. Prices for farm products are satisfactory. This is particularly true of sugar beets, which are becoming the principal crops on many Government projects. Little doubt exists that the present year will bring the greatest prosperity in the history of Federal reclamation."—Hubert Work, Secretary of the Interior.*

This year water users on every project informed me that there was an entirely different feeling from that which existed last year. Settlers are confident; the irrigation organizations are ready to cooperate with the department in any constructive program for improvement of conditions. As my visit was mainly to the older projects and its purpose to confer with the irrigators and their organizations about improvement of canals, building of drains, settlement of unoccupied lands, and the working out of crop and marketing programs which would stabilize conditions and increase revenues, this changed attitude was of the greatest value.

Last year it was necessary for both you and myself to deal mainly with the obligations of reclamation projects and the necessity for meeting those obligations. This year it was not necessary to refer to those matters. The action of Congress, largely the result of your continued efforts to promote the legislation

passed in the adjustment bill, has taken from settlers the threat of having to pay the water charges on unproductive land. It has also wiped out debts which water users did not believe they should be called upon to pay; it has extended the time of payment, and so overcome the adverse influence of temporary hard times in agriculture. Settlers everywhere were friendly to the department and planning for the future.

In order that you may understand the difference in the character of the conferences had last year and this, and also the character of the work which it is proposed to do to improve conditions on different projects, I will deal separately with the projects visited in the order in which they were visited.

### ECHO RESERVOIR, UTAH

A conference was held at Ogden, Utah, with officers of this bureau and the committee engaged in securing subscriptions for water rights in the Echo Reservoir. The plans for this construction are completed. Contracts can be let whenever subscriptions have been received for 80 per cent of the water in the reservoir. Owing to the large number of farmers and the diversity of irrigation interests that have to be coordinated, it has taken more than a year to secure the necessary subscriptions, although the local committee has worked assiduously during the entire time. Belief was expressed that the present shortage of water would result in securing the necessary subscriptions, which has since been accomplished.

### TRUCKEE-CARSON IRRIGATION DISTRICT AND SPANISH SPRINGS DIVISION OF THE NEWLANDS PROJECT (NEVADA)

At Lake Tahoe I met the attorney for the Truckee-Carson irrigation district and engineers making surveys for the Spanish Springs division of the Newlands project. Although Nevada is suffering from an acute shortage of water, it is believed that by the exercise of economy and by rotation in delivery all the crops under the Lahontan Reservoir will be saved. Arrangements were made for pumping from this reservoir to supply a part of the irrigators under the Truckee Canal, while those depending entirely on the stored water in Lake Tahoe would be in a better position than heretofore, because the water in the river is now being distributed by a water master, in accordance with the



provisions of a recently rendered court decree.

Different conferences showed that there exist in Nevada misgivings about the feasibility of the Spanish Springs project. These arise out of the low stream-flow records of the last three years and the large private development on both the Carson and Truckee Rivers in recent years, which makes an increased demand on the natural flow of both streams, and hence lessens the amount of water available for storage. During the past three years it has not been possible to fill completely either of the storages at Lahontan and Lake Tahoe, and little or no benefit would have been derived from the Spanish Springs Reservoir if it had been completed.

The conferencees showed a belief that before entering on this large and costly development further studies should be made to determine whether it would not be better to build a small storage in the main channel of the Truckee or some of its tributaries, which would provide a dependable water supply for the lands under the Truckee Canal, leaving the irrigation of Indian and other lands until there is a better understanding of the amount of the available water supply and the needs of private irrigators.

#### ORLAND PROJECT (CALIFORNIA)

One of the matters dealt with at Orland was the construction on the Stony Gorge Reservoir, which is to provide an additional water supply for the 20,000 acres of land in this project. The construction of this work will insure an ample water supply for the entire area. It will, however, impose an added burden of construction costs on all the land, and this makes it necessary that all of the land be brought under intense culture.

Thus far, for various reasons, this has not been done. On the contrary, only about 15,000 acres of the 20,000 acres are now being irrigated. The 5,000 that is unirrigated is equal in quality to the other, but the shortage of water for the last three years and the falling off in the demand for land by settlers have caused its owners, while meeting their payments, to postpone active efforts to secure settlers.

Now, with an adequate water supply assured, with the suitability of the lands for intense culture under irrigation fully demonstrated, the owners of the unirrigated land are ready to cooperate with the Government in a carefully thought out program of settlement and farm development. The details of this program have not as yet been worked out, but are, in a general way, to include the following:

1. Division of the land into suitable farms.

2. An appraisal of the value of these farms, without regard to ownership, so that the price will be based on their productive value and all, as nearly as possible, be made equally attractive.

3. A small initial payment and a long period, with a low rate of interest, in which to complete payments. At the conference held with these water users it appeared probable that they would adopt the payment plan of the Federal Land Bank, which is 34½ years, with amortized payments drawing interest at 5 per cent.

4. Owners are to level the land and make it ready for irrigation; settlers to be dealt with by a committee of three, made up of a representative of the Reclamation Bureau and two representatives of the landowners.

5. Minimum capital of settlers to be \$2,500.

*"The legislation adjusting payments on Federal reclamation projects enacted by Congress on the recommendation of the Interior Department has brought relief to irrigation farmers of the West. Over \$14,000,000 has been charged off the different projects for unproductive land as a definite loss. Another \$13,000,000 in payments has been suspended as a probable loss. The result has been that these settlers will no longer be called upon to bear burdens they can not carry."—Hubert Work, Secretary of the Interior.*

6. The Reclamation Bureau agrees to issue a descriptive booklet containing a map of the farms for sale, a list of prices, and explaining the views of the department as to the opportunities which are presented. It is also proposed, in connection with similar development on other old projects, to advertise these opportunities under some plan approved by the Secretary in accordance with the provisions of the reclamation appropriation.

#### OKANOGAN PROJECT (WASHINGTON)

The experience of the last 10 years has shown that the water supply of this project is not sufficient. During last winter the early rainfall seemed to indicate that there would be an abundant supply this year, but later it became apparent that there would be another shortage. After irrigation began and near the adjournment of Congress the bureau was asked to install an emergency pumping plant, but there was not time enough to

secure an appropriation for this. My visit to the project with the chief engineer was to confer with the water users about securing next winter an emergency appropriation for a pumping plant from the Okanogan River to supplement the water supply from other sources.

It was feared there would be discouragement and loss of morale on this project, but instead it was found that the landowners on the southern end of the project had already made arrangements for installing three pumping plants of their own. The \$40,000 required to erect one of these was all subscribed in one day, which shows that that section of the project is self-reliant and in a flourishing financial condition. The northern part of the project has suffered more from shortage, because it has fewer old water rights and is not in a position to install its own pumping plant.

An estimate will be made of the cost of a plant to lift 30 cubic feet a second, pumps to lift 20 cubic feet to be installed at the outset. The irrigators have agreed to operate this plant, collecting their own operation expenses, and to meet the construction payments under the terms of the reclamation act. Plans and estimates for contract will be submitted to you for your approval at a later date.

Notwithstanding the great expenses which irrigators have had to incur to secure adequate water for the last three years the farmers on this project are in a prosperous condition. One of the water users, who drove me over the project in a Buick sedan, explained that he estimated his apple crop last year at 1,200 boxes to the acre. It turned out to be 1,700 boxes, and this excess enabled him to buy a new car. The building of three pumping plants by private owners, the hopeful, constructive attitude of the other irrigators, and the willingness to assume the responsibility for the expenses of operation and to pay all construction charges are in gratifying contrast to the discouragement encountered on so many projects last year.

#### YAKIMA PROJECT (WASHINGTON)

The Yakima project had good crops and good prices in 1925. The prosperity which this brought is reflected in the purchase this spring by irrigators on this project of 1,300 motor cars. Conferences were had with representatives of the Tieton, the Sunnyside, and Outlook districts relative to betterment of canals or extension in time of payment, but in these conferences the attitude of the water users was hopeful and constructive. Criticism and bitterness toward reclamation officials, last year so conspicuous, were nowhere in evidence.

### KITTITAS DIVISION, YAKIMA PROJECT (WASHINGTON)

On the 11th of July the State of Washington celebrated the beginning of construction of the Kittitas division of the Yakima project. Sixty thousand acres of this project are privately owned. Conferences were had with owners, representatives of the Northern Pacific Railroad Co., and the district board about plans for subdividing, settling, and developing the irrigated area under a unified plan.

As a result, the Northern Pacific will offer its lands in the upper part of the project for sale at once at prices fixed by the Interior Department appraisers. Much of this land has to be cleared, and the railroad company has agreed to sell the settler one half of what he desires and to reserve the other half for three years without any charge for the option but with the condition that before the second half is sold the first half must be cleared and ready for cultivation. The railroad has a division point at Cle Elum. Many of the employees desire to get a piece of land for a home and can provide the money out of their wages to develop their farms.

At the lower end of the project are 15,000 acres, belonging in part to the

Government, in part to the railroad, and in part to the State and to private owners. I talked to some of the private owners about a cooperative plan for location of roads, without regard to land boundaries, and for the working out of a plan under which all of this land will be cleared and made ready for settlement, the cost to be added to the selling price of the land. We can do this with the Government land out of the \$300,000 provided for such development by the State of Washington. The following tentative program was discussed:

1. The bureau to prepare a large-scale topographic map of the area.
2. The working out of an agreement for coordinated development.
3. Uniform selling contract with not less than 20 years for paying for land.
4. Clearing and leveling land for settlement.
5. Plans for houses and farm buildings.
6. A competent adviser about farm program and farm development.

If this neighborhood agreement is worked out, efforts to organize other sections of the project in the same way will be taken up, and it is hoped that before the four-year period of construction is ended a complete program of settlement will have been thought out and agreed to by the landowners. Practically all of

the Government land is included in the 15,000-acre area before referred to.

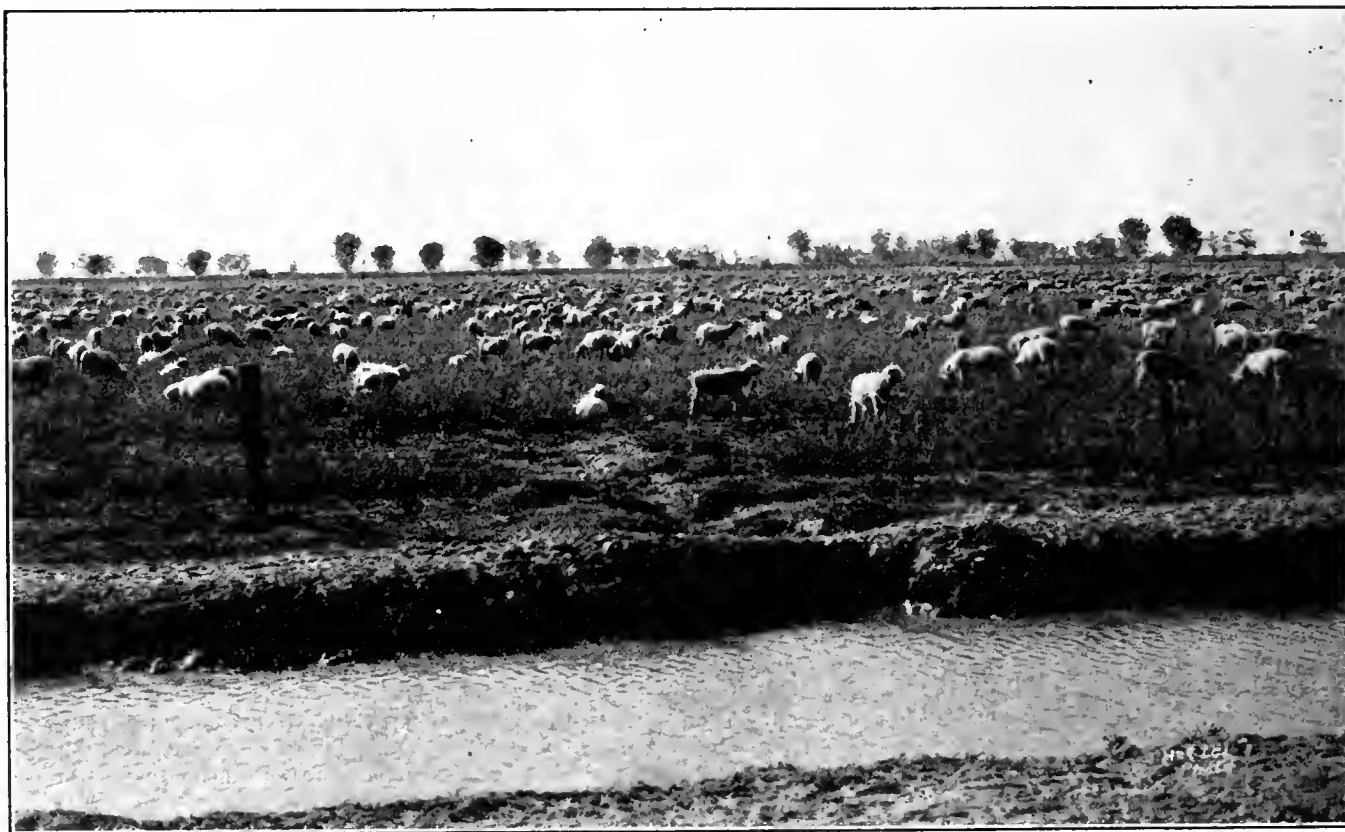
The hearty approval of the development department of the Northern Pacific Railroad and their assured cooperation are due to a realization that an automatic demand for land does not exist.

All of these plans have one weakness. Many worthy settlers will not have capital enough to complete their development. Access to credit of some kind will have to be provided.

### HERMISTON, OREG.

The Umatilla project was visited July 7 and 8, at which time an inspection was made of the McKay Dam now nearing completion. The McKay Reservoir has been built to provide a supplemental water supply for the Umatilla project and for lands under private enterprises that have an inadequate supply. Contracts for a part of the water of this reservoir under Warren Act agreements have been made with the Stanfield and Westland districts, which are not Government undertakings.

Representatives of both these districts appeared at Hermiston to urge that the Government take over their projects, or at least advance money for the reconstruction of their works. It was explained to them that the obligations growing out of appropriations by Congress for new



Many water users find that fattening sheep for market is a profitable undertaking (see page 162)

works and the need for completing the older ones made it impossible to make any promises for assistance of the kind required.

Two contracts have been negotiated this year under the provisions of the act finders' and adjustment acts, whereby the operation of the two divisions of the Umatilla project has been taken over by the water users, and at the time of my visit they were under local management and control. The contracts have not been completed and can not be until the accounts have all been verified, so as to determine the exact amount of the districts' debt to the Government, and until additional surveys have definitely located the areas of class 5 and 6 lands, for which construction payments will not be required.

#### COLUMBIA BASIN INVESTIGATIONS

While in Washington I had conferences, at Seattle and at Spokane, with representatives of the department of conservation and development of the State of Washington and with the Columbia Basin League. These conferences were held to consider the expenditure of \$22,000 appropriated by the State of Washington and \$25,000 appropriated by the Congress of the United States for investigations to determine how the waters of the Columbia River should be allocated between the States of Montana, Idaho, Washington, and Oregon, and for further investigations needed to determine the feasibility of the Columbia Basin project. At the second of these conferences, held at

Spokane on July 12, the State engineer of Oregon and deputy State engineer of Idaho were present to consider the allocation of the water, and a subsequent conference, on July 14, was held with the State engineer of Montana.

All engineers' reports regard Lake Pend Oreille as the most feasible storage for the Columbia Basin project. If used for this, the height of the water level in the lake will have to be raised and compensation will have to be paid the landowners around the lake whose property would be flooded.

At the conference I agreed to submit for your approval an allocation of \$5,000 from the sum appropriated by Congress to pay for an appraisal of the damages to be caused by raising the lake level and for compensation to be paid, the State to allocate an equal sum from its appropriation.

I agreed to recommend an allocation of \$15,000 from the appropriation made by Congress for a study of the economic conditions which will control the settlement and development of the project lands. The representative of the State of Washington agreed to recommend that the State allocate and expend from its appropriation \$15,000 to make a survey of the power possibilities of the project and the revenues which might be expected to come from their development.

The economic survey to be made with the funds appropriated by Congress would include, in part, the selection of three typical areas of 10,000 acres each

in the area to be reclaimed; the gathering of information on these areas as to the ownership of the land in each area, the price at which the owner would sell to the Government if it carried out the recommendations of the last report and purchased the land, or the price at which the owner would sell the land, as small farms, to settlers direct. Inquiries would be made to ascertain what use is being made of these areas at present, what use can be made of them without irrigation, what it will cost to level and prepare the land for irrigated culture, the crops which could be grown, and a supplemental study to determine the places where these crops could be most profitably marketed, the probable demand, and, generally, the influences which would determine the effect of the reclamation of this large area on the welfare of agriculture and the Nation in general. I therefore submit for your approval the following:

1. Allocation of \$5,000, to be used with an equal sum provided by the State of Washington, to ascertain what will be the probable cost of utilizing Lake Pend Oreille as a storage for this project.

2. That \$15,000 of the sum appropriated by Congress be expended in the economic survey above outlined to determine how the privately owned land can be settled and improved.

#### LOWER YELLOWSTONE PROJECT (MONTANA)

On July 14, in company with Chief Engineer Walter and Director of Recla-



Potatoes on raw land on the North Platte project, Nebraska-Wyoming (see p. 151)

mation Economics Kreutzer, the Lower Yellowstone project was visited. The department has agreed to contract with this project for an extension of construction payments in accordance with the adjustment act, but the contract is conditioned on the department being given options as selling agent on 8,000 acres of land on satisfactory terms and prices, so that the bureau can actively assist in securing settlers.

The visit to this project shows the necessity for a new and different type of settlement. After being operated at a loss for 15 years, only one-third of the project was irrigated last year. This year the acreage record will not be much better. Yet I saw as fine crops of irrigated grain, alfalfa, and sugar beets on this project as were seen on any project, but I also saw large areas of grain and lesser areas of sugar beets and alfalfa burned up and ruined because the dry farmers on this project refuse to irrigate, although the canals were and had been full of water throughout the season and no one had been denied water.

Our contract with the Lower Yellowstone project provides that \$50,000 be raised by July 15, in order that the deficit for operation and maintenance of previous years should be avoided, it being agreed that it should be operated this year on contributed funds. The money was raised and paid on time. There was some protest about advance payments on the part of a few, but the great majority of the people on the project, and especially all those who are looking to its betterment, heartily approve of the contract and the new payment policy.

Prior to the meeting with the people of the project a conference had been had with Mr. Hughes, head of the colonization department of the Northern Pacific Railway, and with a representative of the Holly Sugar Co., regarding a uniform land-selling contract for all the land on which options are to be taken. The following conditions as to options were approved: Time of payment to be 20 years; interest, 6 per cent; payments to be amortized; cash payment of 10 per cent; all approved settlers to have \$2,500 in money or equipment.

These are to be submitted to those who have given options on their lands. A new contract is being prepared and will be reviewed by representatives of the Great Northern and Northern Pacific roads and the committee obtaining options before it is sent out.

Meantime Mr. Kreutzer, with the aid of competent soil experts, is appraising the value of the improvements and of optioned farms to determine whether the prices asked can be approved and recom-

mended to settlers. I have advised Mr. Kreutzer that in appraising he should fix the value of the land on the assumption that all taxes and irrigation charges were paid. From this should be deducted the taxes due the county and State and operation and maintenance charges due the Government. The settler will have to assume the obligation to pay these. If these options are worked out, the Northern Pacific and Great Northern roads have agreed to put men in the field to solicit settlers for the project.

The solvency of the project depends on more settlers who are irrigation farmers. The contract we are making with the project will be worth nothing unless this is done. Payments will not be made. I am very anxious, therefore, through the coordinated action of landowners, railroads, and other interests, to place 100 new settlers on this project before irrigation begins next year.

I have discussed with the railroads the running of a land seekers' excursion some time in October. If this is done the railroad advertising should be supplemented by notices from this department in papers like the Country Gentleman, Farm and Fireside, and Hoard's Dairyman. Meantime we would prepare pamphlets on both projects, telling of the opportunities afforded settlers. These pamphlets would be actively circulated by the railroads and the beet-sugar people and the local development association.

#### **BELLE FOURCHE PROJECT, SOUTH DAKOTA**

In company with Mr. Kreutzer, Director of Reclamation Economics, an inspection of the Belle Fourche project was begun on July 16 and completed on July 18. During this period a number of conferences were had with the irrigation district board and with others interested in the development of the project. This included general officials of the Chicago & Northwestern Railroad, representatives of the Great Western Sugar Co., of mortgage and trust companies that have loaned money on farms in the project and had to take them over under foreclosures, and representatives of the Department of Agriculture. On June 17 there was a picnic held at the experiment farm on the project, attended by about 5,000 people. The sanguine, constructive attitude manifested on other projects visited was clearly apparent here.

The conferences dealt with the steps which should be taken to complete the settlement and agricultural development of this project. If this is done all problems of reclamation payments will be solved. The crops on this project are excellent, although the sugar beets showed

a shortage of labor that has prevented proper cultivation and thinning of some crops.

The outstanding need is settlers who will be good farmers. The 65,000 irrigable acres of the project are divided into 965 farms, of which 119 are entirely idle and 531 are unoccupied, having neither owner nor tenant living on them. The highest average yield of sugar beets obtained in this country last year was obtained on this project. The average value of the crop was \$133 an acre, and the average value of potatoes was \$197 an acre. Cucumbers were a profitable crop last year, the average value being \$133.50 an acre. The maximum yield of alfalfa was 6 tons to the acre, while the average was only 1.6 tons, this low average being the result of neglect to irrigate or poor cultivation by tenants.

The attempt of tenant farmers to cultivate more land than they can farm properly and the tendency to depend too largely on rainfall by those who find it difficult to pay for water, or who have prejudices against doing so, have operated to hold back what can be made one of the best of our Federal reclamation areas. A contract satisfactory to water users and to the Government has been negotiated which will give them the benefit of the long-time payments under the adjustment act and cover into construction payments delinquent when the contract is finally approved. Owing to the need of settlement and development under this arrangement, there will be a preliminary period before full payments are to begin.

One condition of the contract is that the Government be given options as a selling agent for 10,000 acres of land, the idea being to be sure of having farms and to prevent inflation of prices if the Government and other agencies enter into an active program of settlement. Options on the necessary area of land have been secured, but the land has still to be appraised and an agreement reached as to terms of purchase.

The conditions of sale and closer settlement submitted to the Lower Yellowstone project were discussed at Belle Fourche, and will be submitted to those who have given options on their land.

Mr. Kreutzer remained on the project to assist in an appraisal of the farms and to make sure that prices have a correct relation to productive values. A progress report of this appraisal of 21 farms, made by Mr. Kreutzer, states that the appraisers were agreeably surprised with the improvements found on, and the general desirability of, many of these farms.

Settlers here will not have to take raw land. On many of the farms that will be

(Continued on p. 151)



## *A Letter to Doctor Mead from Australia*

*From William Cattlanach, Chairman of the State Rivers and Water Supply Commission, Victoria, Australia*

I READ with great interest the reports and papers that we have received from your side, and it is undoubted that your problems are both numerous and complicated. The greatest difficulty is, of course, the attraction of cities all over the world, not only on account of the wages paid but on account of the conveniences which at one time were looked upon as luxuries, but are now considered by almost everyone as essentials to one's well-being. It may seem a platitude to say so, but the only thing, in my opinion, is to keep pegging away to try and make country life as attractive as possible, and you are doing great work in endeavoring to supply the irrigation settlers with money at reasonable rates and under reasonable repayment conditions. You will remember this was the most attractive feature of the Victorian Closer Settlement, and I feel sure that without it there would be a great falling off in land settlement. So far there is a reasonable demand for irrigation blocks.

While I write this, however, I want to say again, and perhaps this is also a

platitude, that the whole success of our and your schemes will depend upon personality. While I agree with you that the man with \$1,500 has, generally speaking, a better chance than the man with \$250, yet I would sooner take the man with the less amount if he has a personality which will override difficulties and which will enable him to stick it out. These men are hard to find, but I believe that it is not by any means time wasted for myself or some one with a reasonably good knowledge of human nature to see the applicants and put them through a pretty close examination as to their past career, their future aspirations, and their willingness to follow the advice given by the supervisors.

There are a great number of problems connected with irrigation which I think we should all turn our attention to. I think the first one is whether there could not be a wholesale reduction in the amount of water used. I am finding that our most successful orchardists are doing now with only about 5 inches of water, and they are producing sounder

and better flavored fruit than those who are putting on 12 inches or more. In the same way, I believe to be successful agriculturally a much less quantity of water could be used in connection with fodder crops, and notwithstanding experiments which are quoted both from your side and from this I believe that more satisfactory results would come from a reduced quantity being used. Another problem that is giving us great trouble is the question of drainage. I have insisted upon measuring pits being sunk in our various irrigation areas, and it is undoubted that in many cases the water table is surely rising. I have often wondered as to whether this accounted for some of the Old World irrigation schemes going out. I am satisfied in any case that it is a very difficult problem here and will need strong action to combat it; of course, on the other hand, the less water used the less acute would the drainage problem become. Another great problem here is the question of marketing. This may not be nearly so acute with you with the large population in your own continent, but in Australia, with a handful of people, it is very difficult sometimes to find outlets, and again these outlets are distant so much further than are yours. I quite recognize that this last phase may right itself, because population should increase while, on the other hand, the irrigation possibilities are limited by the water available.

## *Confidence Replaces Discouragement*

(Continued from page 150)

offered the land has been leveled, fences built, and substantial buildings erected. Many have grain and alfalfa growing on them, so that the settler who buys here will secure a farm that is a going concern. Where farms have been listed at a higher price than this bureau regards as warranted, the owners will be required to reduce their prices. When the options have been completed, the railroads, local authorities, and the Government will enter into a campaign of publicity to secure settlers.

There were interesting discussions at the Belle Fourche conferences regarding the kind of agriculture and crop program which should be adopted. It is a country well suited to dairying and to the raising and fattening of sheep. On the experiment farm 40 ewes and 50 lambs were being fattened on 5 acres seeded to sweet clover and alfalfa. The raising and fattening of lambs on the project and the excellent range surrounding it has unusually good opportunities, and it is an

attractive kind of farming to people who enjoy livestock. The same opportunities exist with regard to dairying.

A portion of the project is unusually well suited to growing sugar beets. It was agreed, therefore, that in the efforts to secure settlers these agricultural possibilities should be stressed and attention called to them in some of the leading dairying and stock-raising districts of the country.

If a considerable percentage of the unoccupied or unirrigated lands of the Lower Yellowstone and Belle Fourche projects can be settled with the right type of farmers by the beginning of the next irrigation season, it will have placed two Federal reclamation projects on a sound financial footing and pointed the way to similar development on other projects.

There is equal need for similar efforts on the Fort Laramie division of the North Platte project and on the irrigable lands of the Riverton project.

ELWOOD MEAD,  
*Commissioner of Reclamation.*

## *Potatoes on Raw Land North Platte Project*

The illustration on page 149 shows a crop of potatoes being raised on raw land on the Fort Laramie division of the North Platte project in Wyoming. The land on which the crop is being raised is Government land and was leased in the spring to W. M. Helmreich, of Huntley, Wyo., for agricultural purposes.

The sod was first disked twice and then plowed to a depth of 8 inches. The crop was planted between May 1 and May 15 and 10 bushels per acre of Irish Cobbler seed were planted. The seed was obtained from the Red River Valley in North Dakota.

The illustration shows the condition of the crop on July 10, at which time the first irrigation had just been completed.

The soil is a Rosebud silt-loam soil and is classified as class 1 land. Mr. Helmreich has 60 acres in this crop and estimates that the yield should be approximately 350 bushels per acre.



## Project Feasibility Basis For Construction, Says Attorney General

*In letter to Representative Sinnott and Senators McNary and Stanfield, of Oregon, the action of the Secretary of the Interior toward construction of the Baker project is upheld*

**I**N a decision made public recently the Attorney General ruled that the Secretary of the Interior is not compelled to expend appropriations made by Congress for construction of new reclamation projects unless he is certain of their feasibility, their adaptability for settlement, and repayment of their costs to the Government.

The decision was rendered in connection with the proposed new Baker project in Oregon. Recently Senators Charles L. McNary and Robert N. Stanfield and Representative N. J. Sinnott, of Oregon, contended before the Attorney General that the Secretary of the Interior was obliged to build the project, Congress having made appropriations for it in five consecutive appropriation acts.

The Attorney General in his ruling calls attention to other provisions of the appropriation acts authorizing the Baker and other projects, which provide for the making of contracts with irrigation districts for the repayment of construction, operating, and maintenance costs within a fixed term of years. These contracts under the law must be confirmed by a court of competent jurisdiction. As a result of these terms, the Attorney General points out, the Secretary of the Interior must exercise due diligence and due care for the interests of the United States in making each of these contracts, as to wording and probability of whether the project is of such a nature that it will enable the promisor in the contract to financially perform the terms. He also referred to the new reclamation law passed by Congress two years ago, which specifically provides that construction of a new reclamation project shall not be undertaken until the Secretary of the Interior has certified in writing that it is feasible. The decision contained in a joint letter to Senators McNary and Stanfield and Representative Sinnott follows in full.

HON. N. J. SINNOTT,  
HON. CHARLES L. MCNARY,  
HON. ROBERT N. STANFIELD,  
*Committee on Public Lands,*  
*Washington, D. C.*

GENTLEMEN: Your esteemed favor of July 13, 1926, received, and it has had painstaking and thorough attention given to it. You state:

We feel that the manifest purpose of Congress in making the fifth appropriation for the project—namely, the purpose

to have the project constructed—should not be frustrated by interpretation until you have carefully considered the record relating to this fifth appropriation.

In connection with this matter, the letters and documents you have submitted have been carefully considered.

Looking at the appropriation act passed for the year 1927, being Public. No. 206, Sixty-ninth Congress, I find that paragraph 1, found on page 30 thereof, provides:

No part of the sums provided for in this act for the Sun River, Owyhee, Vale, and Baker projects shall be expended for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or irrigation districts organized under State law providing for payment by the district or districts of the cost of construction, operating, and maintaining the works during the time they are in control of the United States, such cost of construction to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than forty years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Upon such confirmation of such contract as to any one of such projects, the construction thereof shall proceed in accordance with any appropriations therefor provided for in this act.

What Congress intended to do is expressed very clearly, and it is provided that upon the confirmation of the contract "as to any one of such projects," then, and not until then, shall the construction "proceed in accordance with" appropriations provided for; that a contract shall be made; that after its making it shall meet with the approval of a court of competent jurisdiction; and that in no event shall more than 40 years elapse before the cost of constructing, operating, and maintaining of the works shall be repaid to the United States.

The part of the law providing for the making, approval, and certain terms to be contained in the contract was enacted in 1924, and has been by Congress clearly, fully, and explicitly brought forward and incorporated into the 1927 appropriation act. Distinctly, Congress provided, as a condition precedent to the expenditure of the money provided for, that there should be such a contract made and thereafter confirmed by "a court of competent jurisdiction."

Beyond the shadow of a doubt, Congress has said that the cost of "construct-

ing, operating, and maintaining the works during the time they are in control of the United States" should be paid back to the United States by the contracting promisor within "40 years from the date of public notice" referred to in the bill.

In the making of the contract, and the submitting of evidence to the court of "competent jurisdiction" in order to get that court to "confirm" the contract, the Secretary of the Interior, or any subordinate official under him, who should be charged with the duty of presenting all the facts relevant to such court of "competent jurisdiction," in order to obtain the confirmation of the contract by such court, would be derelict in the performance of his duty if he did not present all of the available information that would be of assistance to the court so as to help the court to determine whether or not the contract presented for its confirmation was such a contract as would, with a reasonable degree of certainty, provide for and obtain the repayment within 40 years to the United States of the moneys expended by it in the "constructing, operating, and maintaining of the works." In my opinion discretion should be exercised both by the Secretary of the Interior in making of the contract and the court of "competent jurisdiction" in confirming the contract, to see that not only the terms of the contract provide for the return of the money within the specified time but that the contract was made with parties that in all probability would be able to financially carry out the terms of the contract and make the payments provided for therein.

If in expending the moneys provided for by this appropriation for the construction of an irrigation project a place should be selected where there could be made no water available for irrigation purposes, it would be apparent that no contract could be entered into by the Secretary of the Interior that would, with any degree of certainty, provide for the return to the United States within the time limited the cost of "constructing, operating, and maintaining the irrigation works." Under such circumstances no party financially responsible would agree to make the necessary payments. In order for the Secretary of the Interior to exercise due diligence and have due care for the interests of the Government of the United States in the making of a contract such as must be made under the

terms of this act, it will be necessary for him not only to look at the wording of the contract but to the probability of whether or not the project is of such a nature that it will enable the promisor in the contract to financially perform the terms as expressed in the words thereof.

That Congress intended that these matters should be thus handled is made more apparent and conclusive by its failure to repeal that part of the act of June 17, 1902, which reads as follows:

That upon the determination by the Secretary of the Interior that any irrigation project is practicable, he may cause to be let contracts for the construction of the same in such portions or sections as it may be practicable to construct and complete as parts of the whole project. \* \* \* He shall also determine the charges which shall be made per acre upon said entries, and upon lands in private ownership which may be irrigated by the waters of the said irrigation project, and the number of annual installments, not exceeding ten, in which such charges shall be paid and the time when such payments shall commence. The said charges shall be determined with a view of returning to the reclamation fund the estimated cost of the construction of the project and shall be apportioned equitably.

If it were at all necessary to further search in an effort to find the intent of Congress, it is found in that part of the act of December 5, 1924, which reads as follows:

No new project or new division of a project shall be approved for construction or estimate submitted therefor, by the Secretary, until information in detail shall be secured by him concerning the water supply, the engineering features, the costs of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

That part of the appropriation act of the Sixty-ninth Congress to which you have called my attention provides:

No part of the sums provided for in this act for the Sun River, Owyhee, Vale, and Baker projects shall be expended for construction purposes until a contract or contracts \* \* \* shall have been let.

To my mind it is inconceivable that Congress should have intended that the vast amounts of money appropriated for the Sun River, Owyhee, Vale, and Baker projects were to be expended without any regard to the financial responsibility of the contracting parties, the kind of a contract that should be made; that neither the Secretary of the Interior nor anyone else should inquire into the feasibility of the projects nor determine what payments or when the payments should be made, the adaptability for actual use and settlement of the lands to be irrigated, and

whether there would be, in fact, water to irrigate with. For many years a public policy has existed familiar to Congress and to all other parties experienced in dealing with governmental irrigation activities in the West, and that policy is expressed in the law quoted. There is no sudden reversal of this policy to be found in any enactment of Congress. The law applicable to the Baker project is the same as that applicable to the Sun River, Owyhee, and Vale projects. All the provisions of the law heretofore referred to were wisely and judiciously incorporated into the statutes. That Congress intended to pursue the same policy and has exercised the same degree of care and caution that it has provided for in the past is emphasized in the wording of the act under consideration, wherein it is provided:

Upon such confirmation of such contract as to any one of such projects, the construction thereof shall proceed in accordance with appropriations therefor provided for in this act.

No contract, then no confirmation; no confirmation, then no contract; and when you go back into the law and read the provisions above quoted, there is left no chance for uncertainty as to many of the conditions Congress intended the Secretary of Interior should take into consideration before making a contract.

In determining the intent of Congress in this matter I have looked to the plain and unambiguous language of the statutes for my guidance.

Very truly yours,  
(Signed) JOHN G. SARGENT,  
Attorney General.

## *Irrigation in India Covers 50,000,000 Acres*

A recent report of the Bureau of Foreign and Domestic Commerce states that the total area now under irrigation in India is nearly 50,000,000 acres. About 23,000,000 acres are irrigated by Government and private canals, 7,000,000 acres by artificial pools called tanks, and more than 14,000,000 acres by wells.

"Irrigation works in the Punjab have resulted in the opening to cultivation of large areas of great fertility which had hitherto been unsuitable for development because of the lack of sufficient rainfall. Such irrigation projects have resulted in what are known as canal colonies; and the result of this development may be gauged from the fact that Lyallpur, the capital of the upper Chenab colony, now has a large export trade, and the population of the area of which it is the center has increased from 8,000 to 800,000 in the course of 10 years.

"Numerous irrigation projects have been considered by the Indian Government; the most important and ambitious of these is known as the Lloyds (Sukkur) barrage and canal projects, located in Sind Province. This canal is expected to open up to cultivation considerable areas in that Province. The project consists of seven new canals and a barrage, or dam, to span the River Indus at a point 3 miles below Sukkur. This is one of the largest irrigation projects undertaken, and the combined lengths of the main canals will total 805 miles, of the branch canals 766 miles, and of the distribution system 3,724 miles.



Raking alfalfa on the Yakima project, Washington.

## The Owyhee Irrigation Project in Oregon and Idaho

*The second of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the Sixty-ninth Congress*

**T**HE Owyhee project proposes the irrigation of lands in Oregon and Idaho along the southern and western side of Snake River Valley from a line south of Caldwell, Idaho, to the vicinity of Weiser, Idaho. Based on recent incomplete land classification for appraisal of lands at present without irrigation facilities and on meager data furnished by owners of lands commanded by existing irrigation works, the irrigable area of agricultural land, without deduction for rights of way, is estimated at 124,000 acres. Of this area, 13,000 acres under the Owyhee Canal are receiving a partial supply by gravity from Owyhee River and require supplemental storage only, and 41,000 acres additional are included in districts wholly or partially supplied by pumping from Snake River and for which a full gravity supply would be provided to eliminate present excessive pumping cost.

### SOURCE OF WATER SUPPLY

The proposed source of water supply is the Owyhee River, with an annual run-off of 298,000 to 2,309,000 acre-feet and an average of 1,000,000 acre-feet. Diversion requirements for project lands are estimated at 600,000 acre-feet annually and can be fully met in most years with the aid of 600,000 acre-feet of storage capacity at Hole-in-the-Ground Reservoir site after allowance for 30,000 acre-feet of additional use by undeveloped projects above the reservoir and for reservoir losses. The unused portion of stream flow in years of high run-off would be unavoidable waste. With the above irrigation demand and facilities, available run-off records indicate one heavy and two light shortages in a period of 25 years. The diversion of 600,000 acre-feet annually is at the rate of 5 acre-feet per acre, and it is estimated will permit the delivery of 3.25 acre-feet per acre at the land.

Water for the Owyhee Ditch, commanding an irrigable area of 13,200 acres or about 11 per cent of the total project area, may be released under head of 230 to 304 feet and would permit development of considerable power during the irrigation season. As in many years no water may be safely withdrawn from the reservoir during the winter, the power output would be useful only for irrigation purposes. Plans for power development have not been considered nor included in the estimated costs.

### HOLE-IN-THE-GROUND DAM

The dam for Hole-in-the-Ground Reservoir would be located in a canyon section of the Owyhee River about 20 miles above its mouth. The dam would have a total height from foundation to parapets of 360 feet and a top length of 600 feet; the water level would be raised 304 feet. The dam site is in a narrow gorge of felsite, and is well adapted to the arch type of dam proposed, which would contain 405,000 cubic yards of concrete.

The upper 70 feet of the reservoir, with a capacity of 595,000 acre-feet, would be used to regulate stream flow, the lower part serving to catch silt and as dead capacity to permit diversion of waters at sufficient elevation to reach the project lands.

### THE DIVERSION TUNNEL

Aside from the small quantity of water to be released from the reservoir for diversion by the Owyhee Ditch, diversion of irrigation water from the reservoir would be by means of a concrete-lined tunnel about 15 feet in diameter and  $3\frac{1}{2}$  miles long, diverting from the reservoir, with the tunnel sill 230 feet above present water level. At the lower end of this tunnel diversion is made for the Succor Creek division, and the main canal continues for 4 miles. This section comprises  $1\frac{1}{2}$  miles of earth canal, with a bottom width of 30 feet and depth of 10 feet; 1,500 feet of concrete-lined tunnels; 300 feet of concrete siphon; 900 feet of high head steel siphon; 8,700 feet of concrete bench flume, with a width of 17 feet and depth of 11.5 feet, and the balance in concrete-lined sections. There will be no lands irrigated direct from the main canal. The main canal would feed the supply canals for the Succor Creek, Kingman, and Mitchell Butte divisions, the latter in turn feeding that for the Dead Ox Flat division.

From the end of the diversion tunnel in the main canal a concrete-lined tunnel, 10.2 feet in diameter and 4.7 miles long, would serve the Succor Creek division, which comprises principally the lands in and above the Gem irrigation district with an irrigable area of 42,000 acres. Beyond the tunnel the supply canal for this division continues for a total length of 68 miles largely in earth with easy construction.

### SUPPLY CANALS

The supply canal for the Kingman division would have a length of 8 miles and would be largely in earth; lined sections, bench flumes, and siphons would aggregate 1,500 feet.

The supply canal for the Mitchell Butte division, comprising lands between Owyhee and Malheur Rivers, would divert from the end of the main canal. Within the first mile Owyhee River would be crossed with a steel siphon 1,600 feet long under maximum head of about 250 feet. The river crossing would be made on a steel bridge 350 feet long. In Mile 6 a concrete-lined tunnel 2,400 feet long would pass behind Mitchell Butte. The balance of the Mitchell Butte supply canal, with a total length of 63 miles, would be largely in earth and loose rock with few structures of importance.

The Dead Ox Flat division comprises lands north of Malheur River. The supply canal for these lands would start from the end of the Mitchell Butte division supply canal. In Miles 4 to 7 the Malheur River Valley would be crossed with a steel siphon  $2\frac{1}{2}$  miles long, under a maximum head of 250 feet. The balance of this supply canal, having a total length of 38 miles, would be largely in earth with no structures of importance.

### THE ESTIMATED COST

Of the estimated construction cost of \$18,000,000 for this project, including a small amount for drainage, about one-third would represent the cost of the reservoir.

The dam and main canal are now almost inaccessible and will require heavy expenditures for roads to facilitate construction. Aside from waters made available for the Owyhee Ditch from the start of construction on the dam, an expenditure of some \$12,000,000, or two-thirds of the cost, will be required before water can be delivered to project lands.—R. F. Walter.

### THE CONTRACTS

The act of Congress of May 10, 1926, Public, No. 206, making an appropriation for the construction of the Owyhee project, carries a requirement that the contracts for the repayment of the cost must be made with irrigation districts.

There are four irrigation districts embracing land in the proposed Owyhee

project, viz, the Slide irrigation district, the Payette-Oregon Slope irrigation district, the Owyhee irrigation district, and the Gem irrigation district. On May 28, 1926, the Secretary approved forms of contracts for execution with each of these districts. These forms of contract follow substantially the same pattern, and this summary will be confined to the proposed contract with the Owyhee irrigation district, the form of this contract being typical.

The proposed contract, after certain preliminary recitals, defines "old lands," "new lands," and "supplemental lands" of the project. Old lands are lands which have been receiving their water supply by pumping from Snake River, but which will receive their water supply from the Owyhee project after it is constructed, and which will use the project canal and reservoir systems. New lands, as the term indicates, will rely upon the project exclusively for their water supply and irrigation system. Supplemental lands have their canal system constructed at the present time, but will obtain stored water from the Owyhee project. The construction charge of the old lands is to be \$15 per acre less than the construction charge for the new lands.

#### CONSTRUCTION PROVISIONS

The contract provides for the expenditure by the United States of a maximum of a million dollars toward the construction of a storage reservoir on the Owyhee River, known as the Hole-in-the-Ground Reservoir, a distribution system therefrom consisting of certain tunnels, a main canal and branch canals, laterals and structures required in connection therewith, and such drainage works as may be found necessary or desirable. This expenditure is expressly contingent upon the requisite congressional appropriations being made.

In the construction of the canals the Government is to utilize, so far as practicable, the easements reserved to the United States by the act of Congress of August 30, 1890 (26 Stat. 391), or by subsection P of section 4 of the act of Congress of December 5, 1924. Any other right of way needed is to be secured by the district.

Upon the completion of the construction program the Secretary is to render the district a statement showing the total expenditures and the amount thereof repayable by the district. If the construction of the project is so far completed that the delivery of water may be initiated to some part of the district territory, the Secretary may give notice to the district to that effect, fixing a tentative per acre construction charge for the land in such

territory. The construction charge is payable in 39 installments.

#### THE BOARD OF CONTROL

In order that the project may be operated and maintained by the water users after the termination of the construction program, a board of control is constituted, made up of representatives from the directorates of the contracting irrigation districts.

The district is to levy assessments and use its taxing power in order to pay to the United States the amounts coming due under the contract. The district, as a whole, is obligated to pay to the United States the full amount agreed upon, regardless of individual default in the payment of any assessments levied by the district. Thus, what the water users designate as "joint liability" is provided for.

If the district is in default for more than one year in the making of any payment to the United States, the Government reserves the right to refuse to deliver water to the district or to the landowners of the district, and may take over the control of the irrigation system to make this refusal effective; or the Government may reduce the amount of water delivered to the district in proportion to the default of the district in making payment of charges.

After the United States turns over the operation and maintenance of the project to the water users the annual notices of

the amount of the operation and maintenance charges is to be given by the board of control. The operation and maintenance charges are to be uniform to all of the new lands and to all of the old lands of the project.

Until the construction charges are paid the board of control is to employ a project manager satisfactory to the Secretary of the Interior, and if the manager employed by the board is or becomes unsatisfactory to the Secretary the manager is to be discharged, upon the request of the Secretary.

The district is to have access to the books and records of the Bureau of Reclamation, and the Bureau of Reclamation is likewise to have free access to the records of the district.

#### SPECULATION RESTRAINED

In the endeavor to restrain speculation in the land to be reclaimed, the contract provides for an appraisal of the land without regard to any enhancement of value on account of the prospect of a water right from the project. If sales are made at prices above this value, plus the appraised value of any improvements subsequently placed on the land and plus the amount paid toward the construction charge, such surplus is to be divided equally with the project. This is on the theory, believed to be correct, that the project expenditure caused the increase in value, and that the project is therefore entitled to share in the profit.



Sugar beets grown on the Milk River project, Montana



It is the policy of the reclamation laws to spread the benefits of the expenditures from the reclamation fund as widely as possible; and it would be contrary to this policy if a project were to be constructed for the benefit of a few large landowners. The reclamation laws, therefore, prohibit the furnishing of water to more than 160 acres per single ownership. All large landowners who care to do so are given the privilege of selecting the 160 acres which they desire to have irrigated from the project water right; the remainder of their land is excess land, and may receive water from the project only if the owner enters into a contract for the appraisal of the excess land and for its sale within a fixed period at prices and upon terms satisfactory to the Secretary. If a large landowner should refuse to enter into such a contract, he will not be entitled to water for more than 160 acres of his land.

It is a tenet of constitutional law that the States may not tax Federal property without the consent of Congress. In 1916 Congress enacted a law, known as the Smith Act, which permits irrigation districts organized under State laws to tax for irrigation purposes the land of the United States, including entered land upon which final certificate has not been issued. An article in the Owyhee contract makes this provision of law applicable to the lands within the Owyhee irrigation district. This enables the district to collect assessments from such land and to sell same at tax sale if the assessments are not paid.

The contract is to be confirmed in advance by the court. Every landowner is thus given a chance to object, if the proposed contract is illegal or unjust as

to him. In this manner private rights are protected, and the United States and the district are given assurance if the contract is confirmed by the court that the carrying out of the agreement will not later be upset at the suit of a district taxpayer.—*Legal Division.*

#### LAND OWNERSHIP AND PLANS FOR SUBDIVISION AND SETTLEMENT

The Owyhee project includes about 70,000 acres (without deduction for rights of way) of irrigable new land not at present under irrigation, and about 41,000 acres of irrigable land now in small districts which derive their water supply from the Snake River by means of pumping. There are 13,000 acres under the Owyhee Ditch, a corporation which will receive a supplemental water supply from the works to be constructed by the United States.

The land in the pumping districts and under the Owyhee Ditch is in general settled by farmers and is intensively cultivated. Of the 70,000 acres, only 18,000 acres are public land and about 5,000 acres State land. The Eastern Oregon Land Co. is the largest owner of patented land. The other owners of patented land control areas of from 160 to 640 acres. Generally these lands have been in private ownership for a considerable number of years, and attempts from time to time have been made to cultivate them by dry-farming methods, but the low annual precipitation is not sufficient to make this method of agriculture profitable. On the Dead Ox Flat there still remain several settlers who are farming without the use of irrigation.

#### SOILS

The soils of the Owyhee project are generally deep and the surface is such as to make the land adaptable for irrigation. Practically all of the undeveloped land north of the Owyhee River is covered with a heavy growth of black sagebrush. This must be cleared and the surface smoothed in order that water will spread over it evenly. The climatic conditions of the Snake River Valley permit the growth of a wide variety of crops common to the Temperate Zone. Chief among these are alfalfa, Indian corn, the small grains, red clover, potatoes, and beans, and, in certain favored locations, apples and prunes. The project is located a considerable distance from large centers of population, and because of this the freight rates on bulky crops are high. These conditions make it necessary that a diversified agriculture be followed and that crops be concentrated by preserving or manufacturing into products of high values, such as butter, cheese, canned fruits, and vegetables, or that crops be fed to animals and the products sold as beef, mutton, and wool.

Farm units on the Boise project and on the privately developed pumping districts in the vicinity vary in size from 20 to 160 acres, but generally from 60 to 80 acres are considered to be a farm unit sufficient to support a family and to utilize the family labor throughout the year.

#### SPECULATION ELIMINATED

As a condition precedent to the expenditure of the appropriation for the construction of the Owyhee project, the land was to be appraised, so that settlers could buy it on its productive value. This appraisal has been made by a board comprising one appraiser designated by the Secretary of the Interior, one each by the two irrigation districts in Oregon and Idaho (to serve in his district only), and the other selected by the first two representatives mentioned. The deepest soil of even topography and considered to be the best on the project has been appraised at an unimproved value of \$15 an acre. However, there are only 18,459 acres of this character of soil on the project. Lands of rougher topography or of soil not so favorable have been appraised considerably under the above figure. Lands deemed to be temporarily unproductive and of doubtful value were appraised at \$2 an acre and nonirrigable land as low as \$1 an acre. The average appraised value of the unimproved productive land is \$10.20 an acre, and for all the land, which includes the nonirrigable, the value per acre is determined at \$7.42 an acre.



Cutting alfalfa on the North Platte project, Nebraska-Wyoming.





Head lettuce is one of the money crops of the water user, one of whom sold \$86 worth from about  $\frac{1}{8}$  of an acre

This appraisal is to be followed by the execution of contracts between the United States and the various landowners in which the landowners shall agree to sell their excess lands to qualified settlers at the appraised value. This will eliminate the speculative features of land settlement that in the past have proved to be so burdensome to the pioneer home builder.

#### AID TO AND DIRECTION OF SETTLERS

It has been recognized from the beginning that in order to settle this project rapidly and successfully settlers should be selected in accordance with their experience and capital and that some aid and direction should be furnished them after acquiring the land. The low rainfall makes it necessary that as much of the new farm as possible be put under irrigation the first year. To clear all of the land and level it for irrigation, plant it in profitable crops, and erect houses, barns, fences, and other necessary improvements will require the expenditure of capital that few new settlers will possess.

The selection of settlers in accordance with their experience and capital is already a part of reclamation law, and it is planned that when the water is available to irrigate the privately owned land this also be made a feature in disposing of other than public land. Progressive local citizens and officials of the Bureau of

Reclamation have given a great deal of thought and attention to the organization of a local corporation that may pre-

pare some of the land in advance of settlement and create a revolving fund for the purpose of making loans to complete the development and equipment of farms. To date such a corporation has not been organized, but its need is recognized, and attention must be given in the future to creating such an institution.

#### GOOD PROSPECTS FOR SUCCESS

If the land is scientifically subdivided, so that the area of farm units will vary to suit the needs of settlers' capital and labor in the family and boundary lines fit in with canals and drainage courses, and if this is followed by the preparation of some land before settlement and the creation of some long-time credit, there is little doubt of the successful and rapid development of the project. Without these essentials, settlement and farm development will be slow and there will be a delay in the return of the cost of constructing the project.—Geo. C. Kreutzer.

We are confronted by the need for more money in the development of farms, the exercise of more science and skill in their cultivation, and the organization of communities so that they can meet the social and economic problems more effectively than they have in the past.

#### INVENTORY OF DAIRY CATTLE ON RECLAMATION PROJECT FARMS AT CLOSE OF 1925

State	Project	Number	Value	
			Each	Total
Arizona	Salt River	18,052	\$85.00	\$1,534,420
Arizona-California	Yuma	1,554	71.76	111,521
California	Orland	218	75.00	241,890
Colorado	Grand Valley	3,389	36.93	51,297
	Uncompahgre	1,700	35.36	166,187
Idaho	Boise	4,607	42.23	405,725
	King Hill	644	50.00	32,190
	Minidoka:			
	Gravity division	3,992	63.19	252,241
	Pumping division	2,610	51.48	134,365
Montana	Huntley	1,968	37.00	72,830
	Milk River	914	56.22	51,390
	Sun River:			
	Fort Shaw division	849	46.51	39,489
	Greenfields division	1,006	38.18	38,415
Montana-North Dakota	Lower Yellowstone	1,947	50.20	97,847
Nebraska-Wyoming	North Platte:			
	Interstate division	5,284	45.00	237,780
	Fort Laramie division	1,752	45.00	78,840
	Northport division	131	45.00	5,895
Nevada	Newlands	8,184	85.00	695,651
New Mexico	Carlsbad	377	61.47	23,175
New Mexico-Texas	Rio Grande	6,373	81.79	521,274
Oregon	Umatilla	2,784	54.82	152,619
Oregon-California	Klamath:			
	Main division	3,234	60.00	190,040
	Tule Lake division	255	60.00	15,300
South Dakota	Belle Fourche	3,714	36.78	136,600
Utah	Strawberry Valley	3,000	55.00	165,000
Washington	Okanogan	307	52.07	16,091
	Yakima:			
	Sunnyside division	12,063	56.95	687,041
	Tieton division	2,752	62.76	172,705
Wyoming	Shoshone:			
	Garland division	1,720	43.82	75,378
	Frannie division	551	40.87	22,520
Total and average		104,931	62.18	6,524,586

## Project Women and Their Influence in the Home and on Farm Life

*Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community*

*By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era*

DO the women on the projects desire to retain "their section" in the NEW RECLAMATION ERA? Read a few of the answers made to this question.

"In my opinion it would be a serious mistake to discontinue this subject matter, as I am sure a large number of the entrymen use the NEW RECLAMATION ERA not only as a magazine but as a part of their permanent library. Only yesterday I was talking to a unit holder about a permanent pasture he had, and he stated that the seed was planted in the proportion and amount as outlined in some article of the RECLAMATION ERA some two years ago. This entryman was very much pleased with the results, and what is true pertaining to topics of interest to men surely is of vital interest to the women, and it would appear to me that matters of interest to the women should be continued if we are to keep up the NEW RECLAMATION ERA."

"The problems of the women and children on the projects are fully as important and as numerous as those of the men, and I am strongly of the opinion that the NEW RECLAMATION ERA should carry matter covering at least one or two pages each month of interest and helpfulness to the project women and their families.

"The RECLAMATION ERA is usually read by every member of the family who can read, and furnishes subjects for discussion around the table at home and at school, and I expect in most cases the farmer himself gets the greater part of his information regarding what is in the ERA from either his wife or his children, as during the busy season he does not have time to read a great deal.

"I believe the material that is now being printed in the RECLAMATION ERA for women is of great benefit to the families on the project and to the project as a whole, and I think the pages should be continued.

"Since the profitable cultivation of the land and the establishment of an ideal farm home are the two main objects to be accomplished in reclamation, and as the women have a great deal to do with both, I can not see how the RECLAMATION ERA could fulfill its mission as completely as it should if it neglected the women."

"It is generally recognized now that the woman and her work is nearly as important on the farm as the man with his stock and crops. Why then should she be dropped from the columns of the NEW RECLAMATION ERA—unless the entire periodical be maintained only to publish the necessary project reports, etc.?"

"In my opinion a section devoted to the problems and activities of the women on the farms is just as important as the articles relating to pigs, cows, and crops. I believe further that it will be possible to secure some interesting articles from the project women and that the elimination of the women's section of the NEW RECLAMATION ERA would be received with considerable disappointment by the wives of the farmers on this project."

"It is my opinion that this section is very popular among the project women folks."

"There can be no question but that this section of the magazine is the only portion of the publication that holds the interest of the women folks on the projects, and if they are to derive any benefit along with the men from the publication it is necessary that this department be continued."

"It is my opinion that by all means this section should be retained, if possible. It is admitted that the women are a great factor in reclamation homes, and unquestionably any new ideas or an exchange of ideas which may have the effect of making farm home life more attractive and tolerable will add to the health, interest, and energy of the farmer, which will be reflected in his general prosperity, and in turn serve as insurance for the success of the Government's undertaking.

"It is not imagination that makes it possible to state, with little danger of contradiction, that the successful farms, on this project at least, are the ones where the feminine influence is strong. The farm home should be considered as being as vitally important as the farm ditch or barn, and to devote the ERA exclusively to these latter and similar features and to

those who direct them would leave a void which would be a disappointment to the readers of this periodical.

"On our project we have many women who direct the destinies of both the farm and the home, and it is possible that anything that would tend to remove the means for making the home more attractive would react to the detriment of the whole establishment. If the women on the farms are satisfied, the morale of the farm families is usually high."

"It is my opinion that this section should be continued, as it is well known that the woman's part in the business of the farm is perhaps as important as that of the man."

"I believe that if the ERA is to be interesting to water users of the project the retention of this particular section is desirable, and it should be enlarged and edited to the extent of appealing to the project women. The ERA circulates in the field which is very difficult to satisfy. It is not a technical irrigation journal, but should contain from time to time articles written in popular vein on construction work of the service. It is not strictly an agricultural publication, but it should carry crop items and news of crop yields, movement, and values. It is not a 'Farm and Fireside' publication; but since it goes into the homes of all water users there is every reason to believe that a section should be devoted to the interest of project women. Just what form this should take I am not competent to give you any ideas of value, but I do think that the idea is an excellent one and that the home feature can be made one of the strong and appealing sections of the magazine."

"I want to congratulate you on the interesting articles you are writing for the ERA. They are excellent."

"The project women generally are favorable to the continuation of this section and would very deeply regret its discontinuance, as they find in it many things of interest to them."

## *Advice to the Home Builder*

### *Progressive Construction of Farm Homes<sup>1</sup>*

**P**ROGRESSIVE construction is not new to the farmer, nor is the unit system of building less known to him than to builders elsewhere. Few successful farms, indeed, are completely equipped at the outset.

Modifications in the initial layout and additions to the original structures are often found desirable. Alterations to suit changing needs and supplementary buildings to meet new demands are in logical order. The farmer everywhere develops and improves his farm by successive stages; some with results more truly progressive than others.

As a builder he neither receives the recognition to which he is entitled nor enjoys anything like the helpful guidance and cooperation of kindred interests available to builders in other fields.

As a consequence, we have wasteful methods of construction, unwise and uneconomical selection and use of materials, lack of convenience, low efficiency, expensive upkeep, extravagant remodeling costs, unattractive surroundings, and poor living and housing conditions as compared with urban development.

The farm home is not merely a place of shelter. It has many functions to fulfill and it should be designed to meet these with economy, harmony, and greatest convenience.

The farm house is the center of all human life on the farm. Over one-third of our total population live in farm homes. Its design and equipment are of even greater importance than in the city house.

With an average of seven and one-half buildings on six and one-half billion farms, such buildings deserve careful and intelligent planning, and it is of equal importance to plan the relationship of these buildings on each individual farmstead.

Too many farm buildings are poorly planned to meet the particular requirements of the farm. A far greater number are entirely unplanned.

The value of a well-studied, predetermined plan can hardly be overestimated. To proceed without it invariably results in costly mistakes and everlasting dissatisfaction.

Before undertaking to build, all probable future housing requirements should be

fully listed and given due consideration along with the present essentials.

Without carefully planning to permit of future expansion, or possible changes in duty, or alternate uses, buildings are

rapidly outgrown, become inefficient or completely obsolete.

The problem of providing adequate housing yields not alone to dollars and cents but is as often solved by simple forethought. True enough, a budget must be adopted and followed, but the amount of ready capital available should certainly not govern the ultimate size or layout.

The fact that the farmer's capital is limited, either in establishing himself on a

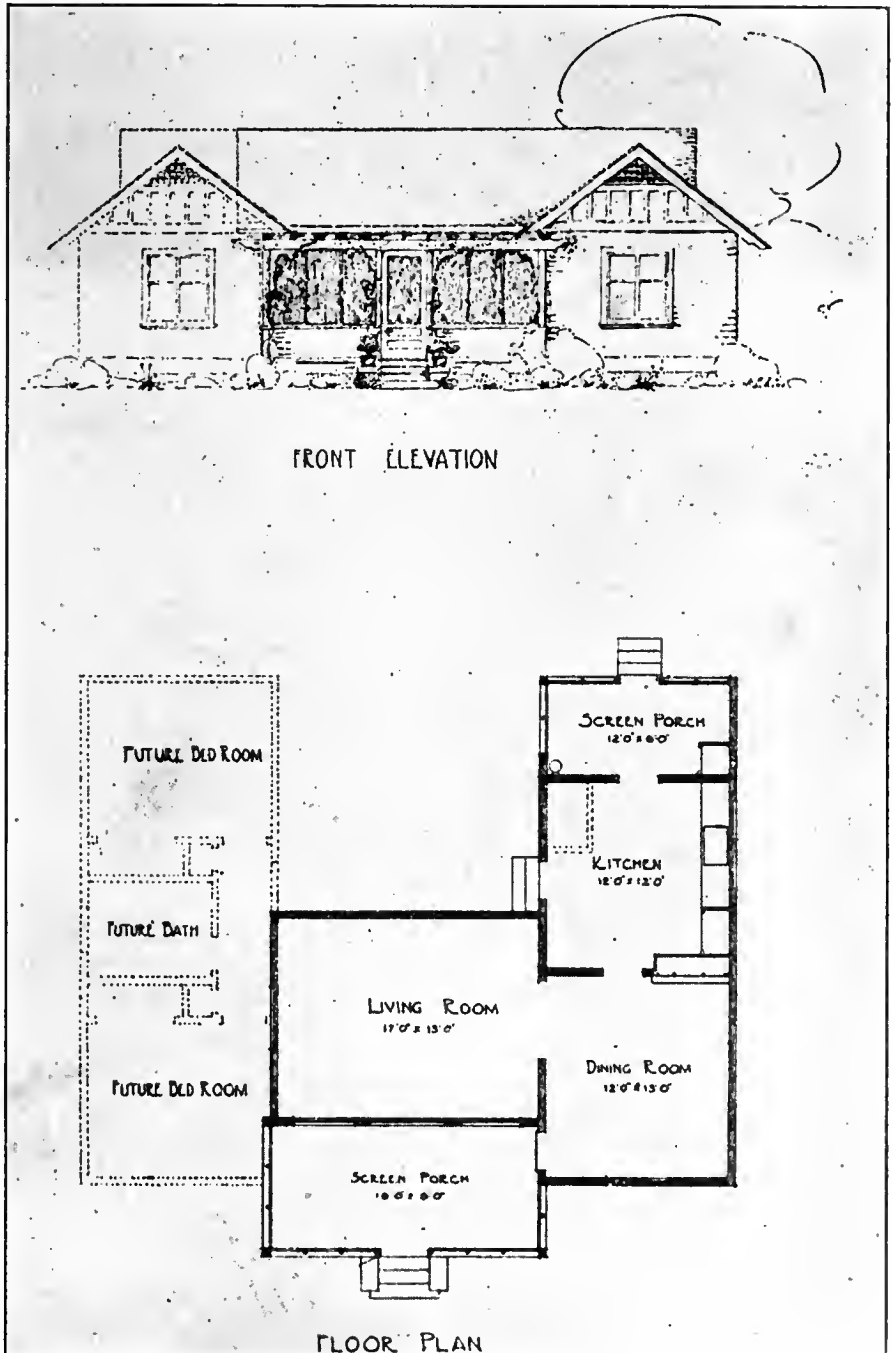


FIG. 1.—Illustrating the possibilities of unit construction. Portion indicated in solid black, or even a single wing, may serve satisfactorily at the outset with the extension indicated in dotted lines added later as funds permit.

<sup>1</sup> By Max E. Cook, Mem. A. S. A. E., farmstead engineer, California Redwood Association (for six years in charge of the building work for the California State Land Settlement Board).

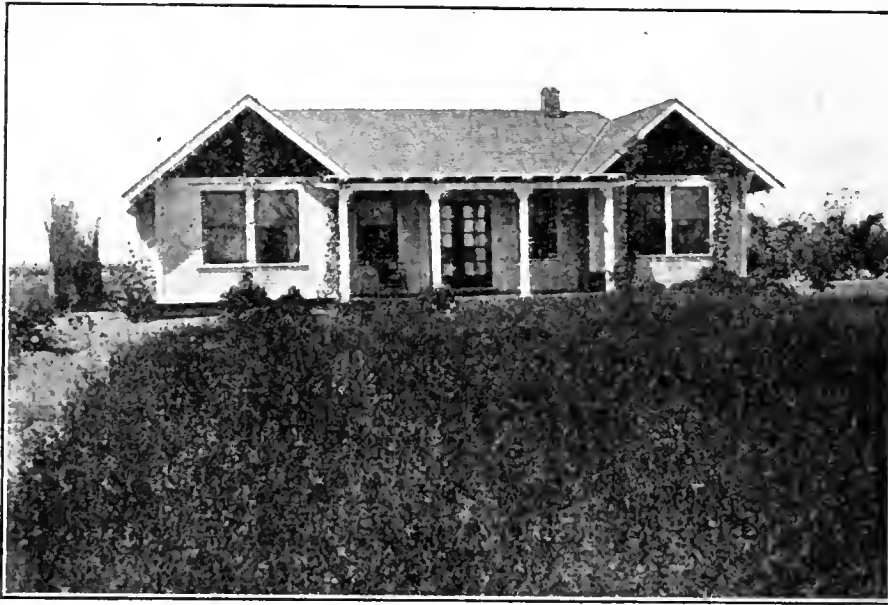


Fig. 2.—House built to a plan similar to Figure 1. The porch was added two years after the first construction work. It may yet be screened

new farm or in making improvements on an existing one, does not justify his proceeding without a comprehensive plan. It makes it all the more necessary to have one.

The poorly planned building or house of bargain materials, adopted because it appears to be the "most for the money," is a poor investment. Quality is too often sacrificed, while rooms and floor areas are held down to a bare minimum and arrangement is inflexible. In the later addition of a needed porch or an extra room or two that are sure to follow, the modest little house with the "Queen Anne" front soon acquires a "Mary Ann" back.

These contingencies are all successfully met by the adoption first of a systematic and orderly plan of procedure. There are three distinct and separate methods by which successful results are obtained progressively without sacrifice to quality or appearance where available funds are yet limited.

(a) *The unit system.*—The unit system of planning and building makes possible many variations in size and layout to meet individual requirements. The principles apply alike, in making new improvements on an established farm or in the development of new farms, either with buildings alone or in the farmstead layout itself. Buildings are designed and laid out as dictated by ultimate requirements, but in such form as to make it possible to build in units to meet only the preliminary needs. Provision is made to avoid waste in making later additions and by anticipating maximum salvage possibilities where actual changes are necessary.

The units as they are developed are complete in every sense, and at least that unit or portion of a building that is built is enjoyed to the limit, containing, as it does, all the features of convenience, equipment, and finish individually desired. (See figs. 1 and 2.)

(b) *Shell or skeleton system.*—Obviously, building on the unit plan is not satisfactory where there is a definite requirement for greater area or larger floor spaces. To obtain the maximum amount of permanent housing at the lowest possible

cost, there is but one road open. It becomes necessary to carefully eliminate the nonessentials, omitting only those things that can be added later with the least inconvenience and without sacrifice to a good foundation, honest frame, solid construction, durable walls, and roof. In other words, build the shell or skeleton of a building, but let it be the nucleus of a better building—a permanent improvement. An advantage that this method has over the unit system is that there is less tendency to depart from the original plan than where the unit system is adopted. Furthermore, the exterior surroundings are undisturbed by later developments.

(c) *Dual-purpose structures.*—Where there are insufficient funds to permit of building, according to recognized standards, either a finished unit of a permanent structure or a good building honestly built that may yet be incomplete as to full equipment, finish, etc., it is sometimes found desirable to erect a building to be occupied temporarily for a given use with a plan for conversion later to meet a future requirement.

Such a building, carefully and thoughtfully designed, can be made to serve very satisfactorily as a temporary dwelling and as such can have many conveniences and be made very livable with considerably less invested than is possible by any other means. All special equipment, such as sash, doors, screens, hardware, trim, etc., are selected of design and type suitable for the more elaborate structure to follow. They are incorporated temporarily in such a way as to be readily removable



Fig. 3.—A 3-room temporary dwelling designed to be converted, at a future date and at minimum cost, into a poultry house



## Women on the Projects and Their Relation to Better Agriculture

*The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life*

and are thus recovered later without damage or unnecessary expense. (See fig. 3.)

Progressive building is merely another means of building on the installment plan. No one method can be considered best while the human element is involved. Obviously, one without real ambition and firmness of purpose should not be encouraged to build a temporary dwelling if there remains any doubt as to their ability to carry on to the development of a better home later. The same obtains, although perhaps to a lesser degree, with the other two methods outlined.

We are fully aware that while each farmer's building problem is an individual one, he yet can not afford direct professional services to assist him, nor can he be successful farmer, agricultural engineer, architect, and master builder alike.

Forward strides were made at the recent National Farm Homes Conference at Chicago with a view to combining forces in furnishing the farmer with suggestive plans and reliable guidance in his building development.

While 95 per cent of all farm buildings are constructed of lumber, there yet remain untouched possibilities in planning farm structures that permit of the utilization of economical lengths and stock sizes of species and grades most suitable.

Hand in hand with any educational effort that is undertaken to promote better farm buildings should go a decidedly closer working relationship with the retail lumber dealer. To keep apace with modern merchandising methods, he is fast converting his former "lumber yard" into a complete building material supply house; in many instances supplemented with a free-plan service. His importance in most farming communities as a "father adviser" on all building matters is too often ignored or overlooked. He merits recognition as one of our strongest allies in the better farm building movement.

### Something to Think About

It is generally known that our farm women are progressive. On some of our projects we have the finest women's organizations that are alive to every opportunity for bettering the conditions on the farm and in the farm home.



Well-planned shade trees add to the attractiveness and value of the property

I have heard of many women planning their vegetable gardens in such a way that it took into account the marketing of a considerable surplus, after the needs of the family are taken care of, and a generous supply stored away for the winter. In many cases she has a particular market in mind, but in more cases it is a hit-and-miss proposition.

One woman writes she found a market for squashes at a hotel in a near-by town; another that the demand for strawberries from her patch had so increased that she is planning to plant another time as many next season; her market for these, however, is not prearranged.

Think of the stimulant to better results if arrangements could be made in advance for the surplus output of each vegetable garden! Why shouldn't this be done?

### Organized Effort

"In union there is strength" is just as forcible a slogan in cooperative marketing of vegetable-garden crops on a small scale as the greater operations of whole farming communities. Indeed, these latter were often attained by small beginnings.

Towns nearest the projects are visited many times in a year by project women, and club and community work often-times draw the farm woman and town woman together. Why shouldn't this

contact be capitalized to the benefit of both the farm woman (the producer) and the city woman (the consumer). Think of the middleman's profit the latter is paying day in and day out. Why not eliminate this? It can be done and should be done on a cooperative basis.

Get together on the projects and talk this over, elect your representatives to meet with the city women, and see if the latter can not arrange for the marketing of the produce sent to town.

The city woman will reap the harvest on every purchase she makes. Besides, there is no better community work than that which even suggests the helpful hand.

### Shade Trees

There is a dearth of trees on many of our projects. There is no one thing you can add to the grounds surrounding your home that will give you so much pleasure. They add to the attractiveness, increase the value of the property, furnish the much-needed shade from the withering rays of the sun in summer, reduce maintenance costs on the home by protection from the elements, foster bird life, which in turn destroy many insects, and purify the air, holding in their foliage the dust that would otherwise settle on the house.

The above photograph shows the effect of well-planned shade trees.



# Sheep Feeding on Grand Valley and Uncompahgre Projects, Colorado

By J. C. Page, Superintendent, Grand Valley Project, and L. J. Foster, Superintendent, Uncompahgre Project

A SMALL amount of individual lamb feeding has been practiced intermittently on the project farms for several years. A few individuals would take bands of 500 to 1,000 lambs from summer range, feed for periods of 45 to 100 days, and then ship to market, receiving current prices. In a few instances the element of speculation in the purchase and sale has proven disastrous and heavy loss incurred. This caused discouragement and prevented the rapid development of an industry which progressive farmers recognize as a necessary adjunct of successful farming, required both as a means of utilizing unsalable forage and increasing the fertility of the farms.

During the month of October, 1925, a banker of the town of Delta on the Uncompahgre project and a successful farmer on the same project with capital secured from Kansas City connections purchased 32,000 head of lambs from points in Utah and Idaho; 7,000 of these lambs were purchased at \$11 per hundredweight, 14,000 at \$12.10, and 11,000 at \$12.25. These lambs were shipped to western Colorado in earload lots of 300 lambs per ear. The distribution of the lambs was as follows: 2,600 on the Grand Valley project, 28,000 on the Uncompahgre project, and 1,400 to other points along the Colorado River. Eight thousand of the lambs were fed on properties owned by the promoters and 24,000 were distributed among farmers here and there under contract.

## THE POUND-GAIN CONTRACT

Each individual farmer, who entered into contract for the feed and care of the lambs did so under what might be termed a pound-gain contract. They accepted the weights of the earload shipment at whatever point shipment was made and received payment at the rate of 10 cents per pound gained. They received the lambs at the nearest railroad point and trailed them to the feed lots. The lambs purchased usually ranged from 60 to 65 pounds at the Utah or Idaho shipping point, and when shipped to eastern feeders the average gain amounted to about 15 pounds per head. The contract feeders, of whom there were about 30, had no investment other than that required for the material and labor for feed lots, which averaged about 10 cents per head, but of course care was exercised to see that the contract feeders had suitable forage and water facilities.

All feeding under contract was done under direct supervision of the owners.

The first one-half of 1 per cent loss by death was borne by the owner, the next one-half of 1 per cent by the contract feeder, and any additional loss was shared equally by both parties. There was little loss during the 1925 and 1926 feeding season, and all contract feeders made good money with the exception of one, and his loss was due to improper care and handling.

## BASIS OF LAMB DISTRIBUTION

The basis of lamb distribution to the contract feeder was in the ratio of one lamb to consume the tops of each ton of beets raised. The feeding period ranged from 60 to 80 days. The lambs were received during October, and the endeavor was to get the necessary increase in weight in time for shipment on the January market.

The best results were obtained by feeding in small inclosures and driving the flock over beet-top pasture or other pasture once or twice a day. Care had to be exercised to obtain the proper ration in order to prevent scouring. The common ration was alfalfa with beet tops. Mangel range was utilized in a few cases. Stubble range was also utilized. No grain feed was required,

as no attempt was made to finish the lambs for market.

On account of location, practically all lambs fed in western Colorado are contracted to feeders in the Middle West, for the reason that it is not advisable to prepare lambs for the packers in a locality where from 24 to 48 hours' travel is required to reach the market point. Such long travel causes excessive shrinkage and the market fluctuations can not be anticipated.

## RESULTS WERE GOOD

As stated before, the average gain amounted to about 15 pounds per head, which under the terms of the contract resulted in a payment of \$1.50 per head to the feeder for each lamb fed. On the basis of the feed and roughage consumed it is estimated that the feeder received 50 cents per ton for his beet tops and \$10 per ton for his alfalfa. The Uncompahgre project feeder did very well with his 1925 alfalfa when consideration is given to the fact that hay was a drug on the market with practically no buyer at any price. Consideration is also given by the progressive farmer to the value of the fertilizer obtained, each earload of 300 lambs producing from 35 to 40 loads of fertilizer.

It is also estimated that in order to carry on operations better than \$300,000 outside capital was diverted to western Colorado during the past feeding season.

The contract feeders are desirous of carrying on similar arrangements during future years, and plans are now being considered for the 1926-27 season. It should not be so difficult to secure additional feeders for future years. The plan in force permitted responsible men with little capital or no capital at all to handle a earload or two of lambs, being limited only by their feeding facilities. An outlet was provided for forage usually without a market; idle time was put to a remunerative use, and probably the best result of all came from the building up of impoverished soil. The success of last year's plan will, it is hoped, enlist the aid of local capital in the further growth of a necessary industry on both projects.

## The Water Supply on the Projects

*Crop damage from shortage of water is certain on the Okanogan project in Washington. Minor crop damage can be averted only by unusual summer rains on the Yakima project in Washington, the Boise and Minidoka projects of Idaho, and the Milk River and Sun River projects of Montana by reason of depletion of storage on which these projects are largely dependent in late summer. On the Yakima project much water has been lost through illegal diversion of project waters by other interests. A threatened severe shortage on the Truckee division of the Newlands project has been reduced materially by initial steps in administration of Truckee River water in accordance with a pending adjudication decree. Unusual rains in early summer, combined with newly completed pumping installations, have removed all danger of shortage on the Salt River project in Arizona.*

The settler under the irrigation canal needs special knowledge of soils and crops with respect to their relationship to water, in addition to their general behavior for agricultural purposes.

## Organization Activities and Project Visitors

**D**R. ELWOOD MEAD, Commissioner of Reclamation, who left for Haiti on August 10 to investigate one of the irrigation possibilities there, returned to his office on August 30.

Homer J. Gault has been designated construction engineer on the construction of the proposed Gibson Dam on the Sun River project, Montana, advertisement for which was opened at Fairfield on August 31. Mr. Gault's post-office address is Augusta, Mont.

Associate Engineer A. C. Jaquith, of the Denver office, who has designed several large dams for the bureau, resigned, effective July 28, to accept a similar position in Mexico.

Engineer Julian Hinds, for the last 10 years in charge of the designing force of the Denver office, has submitted his resignation.

Chief Engineer R. F. Walter was on the Klamath project on July 1. From there he visited the following projects: Columbia Basin, Umatilla and McKay Dam, Yakima and Kittitas division, Lower Yellowstone, Milk River, and Sun River, returning to Denver on the 23d.

H. R. Roberts, of the Irrigation Department of the Union of South Africa, and D. G. Collett, chairman of the Irrigation Board of Graaf Reinet, South Africa, were recent visitors at the Washington office. They are visiting the United States with the desire of seeing as much as possible of our irrigation projects, for application of suitable information and ideas in South Africa.

George C. Kreutzer, Director of Reclamation Economics, was in the field from July 1 to 26, and visited the Riverton, Huntley, Lower Yellowstone, and Belle Fourche projects. He was in Denver from the 27th to the end of the month.

Andrew Weiss, Assistant Director of Reclamation Economics, who has been in the Washington office for some weeks, left for the field on August 11.

Sr. Marcelo Leon, special commissioner of the Secretary of Agriculture of the Mexican Republic, was in the Denver office recently for the purpose of acquainting himself with the methods of construction and operation of the irrigation projects. He is planning to visit several of the projects before his return.

District Counsel Coffey visited the Orland project twice recently in connection with legal matters relating to the closing out of Stony Gorge Reservoir land purchases.

R. T. Keenan, of the Pacific Bridge Co. of Seattle; Walter Ward, of the Ward Engineering Co. of San Francisco; and Fred K. Gettins, engineer for the National Surety Co. of San Francisco, visited the Stony Gorge Dam site during July in connection with the contemplated construction of the dam.

W. W. Putnam, agricultural statistician of the United States Department of Agriculture for Colorado, visited the Uncompahgre project to obtain information relative to crops grown during the 1926 season on the project.

Vietor A. Galli, of the Argentine Republic, was a recent visitor on the Boise and Yakima projects.

S. B. Shannon and N. Shand, of the irrigation department of the South African Government, visited the Boise, Minidoka, American Falls, Yakima, and Riverton projects during the month.

Frank Scott, chief field man for the Utah-Idaho Sugar Co., was a recent visitor on the Milk River project.

T. O. Larson, of Choteau; J. M. Burlingame, of Great Falls; and William Huntsberger, of Great Falls, Mont., who were designated a board of appraisers in connection with the purchase of private lands within the area to be flooded by the construction of Gibson Dam, on the Sun River project, inspected the three tracts of land on August 5 with a view to making a report on their fair purchase value.

J. M. Hughes, land commissioner, and W. P. Stapleton, agricultural development agent of the Northern Pacific Railway Co., were recent visitors on the Lower Yellowstone project in connection with the plans for obtaining settlers for idle land.

State Engineer R. A. Allen visited the project office on the Newlands project in

connection with a proposed domestic water supply for the town of Wadsworth from the Truckee Canal.

Assistant Engineer J. R. Yates and Superintendent L. E. Foster, Carlsbad project, made a trip recently through the upper reaches of the Gallinas watershed on matters relating to the Pecos River adjudication.

Prof. G. R. Hyslop, of Corvallis, Oreg., was on the Klamath project for several days gathering data with County Agent Henderson to make a report on the advisability of leasing Tule Lake lands for a period of more than one year.

Assistant Engineer R. R. Robinson, formerly on the Salt Lake Basin secondary project, has been transferred to the Kittitas division of the Yakima project.

Designing Engineer J. L. Savage was on the Kittitas division of the Yakima project for several days, principally in connection with the problems affecting the construction of the next 10 miles of the main canal.

L. C. Hill, former supervising engineer of the bureau, stopped at the El Paso office of the Rio Grande project on his return from a trip into Mexico.

Col. B. F. Fly, guardian of the Yuma project, and particularly of the Yuma Mesa, is again in Washington, D. C., and a welcome visitor at the Washington office. He is here in connection with the recent damage from the flood on the project and to discuss appropriation matters.

The personnel of the board of engineers who will review all hydrographic and geologic data pertaining to the feasibility of the proposed new dam site between Avalon and McMillan Reservoirs on the Carlsbad project is as follows: Louis C. Hill, former supervising engineer of the Bureau of Reclamation, who will represent the interests of the water users at Carlsbad and Fort Sumner; S. O. Harper, assistant chief engineer of the bureau, who will represent the bureau; and Oro McDermith, a former engineer of the bureau, who will represent the Secretary of the Interior.

## Five Reasons for Crop Rotation

R. C. Stockdale, writing in a recent issue of the Rio Grande Farmer, gives the following five reasons for crop rotation:

1. Rotation of crops is practically 75 per cent as effective as the use of fertilizer in effecting increases in crop yields, being nearly 90 per cent as effective as the use of fertilizer when the results on wheat, corn, and oats only are considered.

2. As based on the average yields at the beginning of the experiments involving fully comparable yields, rotation has been shown to be 91.5 per cent as effective as the use of fertilizer in maintaining the producing power of the soil.

3. In increasing soil productivity the effects of rotation alone may equal or exceed the effects of the use of fertilizer without rotation.

4. The effects of rotation and the use of fertilizer apparently are not the same, as is shown by the fact that their conjoint effects on crop yields are additive, being more than fully additive in most of the cases considered.

5. In permanent crop production, high productivity levels are possible only when rotation and the use of fertilizer are conjoined.



The model of a 40-acre irrigated farm and colored enlarged photographs, forming part of the bureau's exhibit at the Sesquicentennial Exposition in Philadelphia

The art of irrigation dates back to the beginning of written history. A great succession of civilizations, notable and extensive, have flourished on irrigated soils.

The use of water on irrigated lands was not based in ancient days upon scientific principles, but rested merely upon regulations, some of which were wholly contrary to the best modern knowledge.

### FEDERAL IRRIGATION PROJECTS: COMPARATIVE COLLECTIONS

State	Project	Construction				Operation and maintenance			
		June, 1925	June, 1926	Total for year, 1925	Total for year, 1926	June, 1925	June, 1926	Total for year, 1925	Total for year, 1926
Arizona	Salt River			\$599,326	\$643,842				
Arizona-California	Yuma	\$2,673	\$4,029	354,345	345,957	\$4,867	\$7,798	\$308,514	\$232,522
California	Orland	1,536	1,140	36,758	82,794	332	484	26,693	35,617
Colorado	Grand Valley	(1)	(1)	(1)	(1)	3,213	5,994	49,953	60,353
	Uncompahgre	490	1,028	25,612	121,155	704	1,019	76,231	137,544
Idaho	King Hill					4,232		4,303	161
	Minidoka								
	Gravity	742	2,625	62,328	152,663			12,639	31,407
	Southside pumping	699	21	31,206	71,089	572	8	36,998	53,863
	Jackson Lake		531	31,970	40,953	1,104	164	15,963	16,120
Idaho-Oregon	Boise	1,122		225,872	118,601	24,817	1,031	128,799	134,520
Montana	Huntley	211	1,450	19,175	29,239	869	1,451	32,334	36,255
	Milk River	(1)	(1)	(1)	(1)	3,975	1,810	19,249	19,685
	Sun River								
	Fort Shaw	539	1,986	8,092	9,550	753	1,580	8,144	9,069
	Greenfields	(1)	(1)	(1)	(1)	1,411	2,005	15,235	17,661
Montana-North Dakota	Lower Yellowstone		4,891	3,350	18,859		8,817	5,221	28,868
Nebraska-Wyoming	North Platte								
	Interstate	101	1,793	25,250	33,670	148	159	44,483	46,663
	Fort Laramie	(1)	(1)	(1)	(1)	10,444	421	68,136	36,574
	Storage		1,500	31,989	22,690			12,633	4,558
	Northport							22,748	23,381
Nevada	Newlands	47	1,605	39,426	55,277	1,774	1,748	101,467	122,146
New Mexico	Carlshad		819	67,097	48,141		499	64,476	37,565
New Mexico-Texas	Rio Grande	10,635	30,377	210,236	250,021		100,000	211,091	246,701
North Dakota	Williston					5,298		11,004	
Oregon	Umatilla			5,730	417	9,879		27,458	8,002
Oregon-California	Klamath	5,087	19,200	66,407	54,971	264	22,291	58,692	62,506
South Dakota	Belle Fourche						4,023		43,717
Utah	Strawberry Valley	6,608	2,319	77,091	105,851	189	3,145	25,263	34,614
Washington	Okanogan		3,505	1,068	8,739		9,229	3,998	41,185
	Yakima								
	Sunnyside	1,930	18,565	59,249	180,489	12,118	10,249	97,493	169,894
	Tieton	5,809	1,956	149,850	175,994	3,063	1,297	91,292	84,467
	Storage	5,330		63,265	88,305		430	20,577	18,316
Wyoming	Shoshone								
	Garland	91	502	9,961	30,404	2,573	229	19,010	37,029
	Frannie	(1)	(1)	(1)	(1)	1,018	1,069	8,512	8,050
Total		43,740	100,083	2,205,153	2,689,731	93,657	186,950	1,628,609	1,839,043

<sup>1</sup> Projects on water-rental basis.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

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George C. Kreutzer, Director of Reclamation Economics; Andrew Weiss, Assistant Director of Reclamation Economics

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Dehler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak.	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise <sup>1</sup>	Boise, Idaho	J. B. Bond				
Carlsbad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamel	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont.	A. R. McGinness	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill <sup>2</sup>	King Hill, Idaho					
Klamath	Klamath Falls, Greg.	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont.	H. A. Parker	E. R. Schepplmann	E. R. Schepplmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont.	H. H. Johnson	E. E. Chabot	E. E. Chabot	do.	Do.
Minidoka	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Greg.
Newlands	Fallon, Nev.	D. S. Stuver	G. B. Snow	Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte	Mitchell, Nebr.	H. W. Bashore	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash.	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Greg.
Orland	Orland, Calif.	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Rio Grande	El Paso, Tex.	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamel	El Paso, Tex.
Riverton	Riverton, Wyo.	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River <sup>3</sup>	Phoenix, Ariz.	C. C. Cragin <sup>4</sup>				
Shoshone	Powell, Wyo.	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley	Provo, Utah	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg.	H. M. Schilling	C. M. Voyen	C. M. Voyen	B. E. Stoutemyer	Portland, Oreg.
Uncompahgre	Montrose, Colo.	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Yakima	Yakima, Wash.	J. L. Lytel	R. K. Cunningham	J. C. Gawler	B. E. Stoutemyer	Portland, Oreg.
Yuma	Yuma, Ariz.	P. J. Preston	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam	American Falls, Idaho	F. A. Banks <sup>5</sup>	H. N. Bickel	G. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam	Guernsey, Wyo.	F. F. Smith <sup>5</sup>	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Greg.	R. M. Conner <sup>6</sup>	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash.	Walker R. Young <sup>6</sup>	E. R. Mills	do.	do.	Do.
Sun River, Gibson Dam	Augusta, Mont.	H. J. Gault <sup>6</sup>			E. E. Roddis	Billings, Mont.

<sup>1</sup> Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.

<sup>2</sup> Project operated by King Hill irrigation district.

<sup>3</sup> Project operated by Salt River Valley Water Users' Association.

<sup>4</sup> General Superintendent and Chief Engineer.

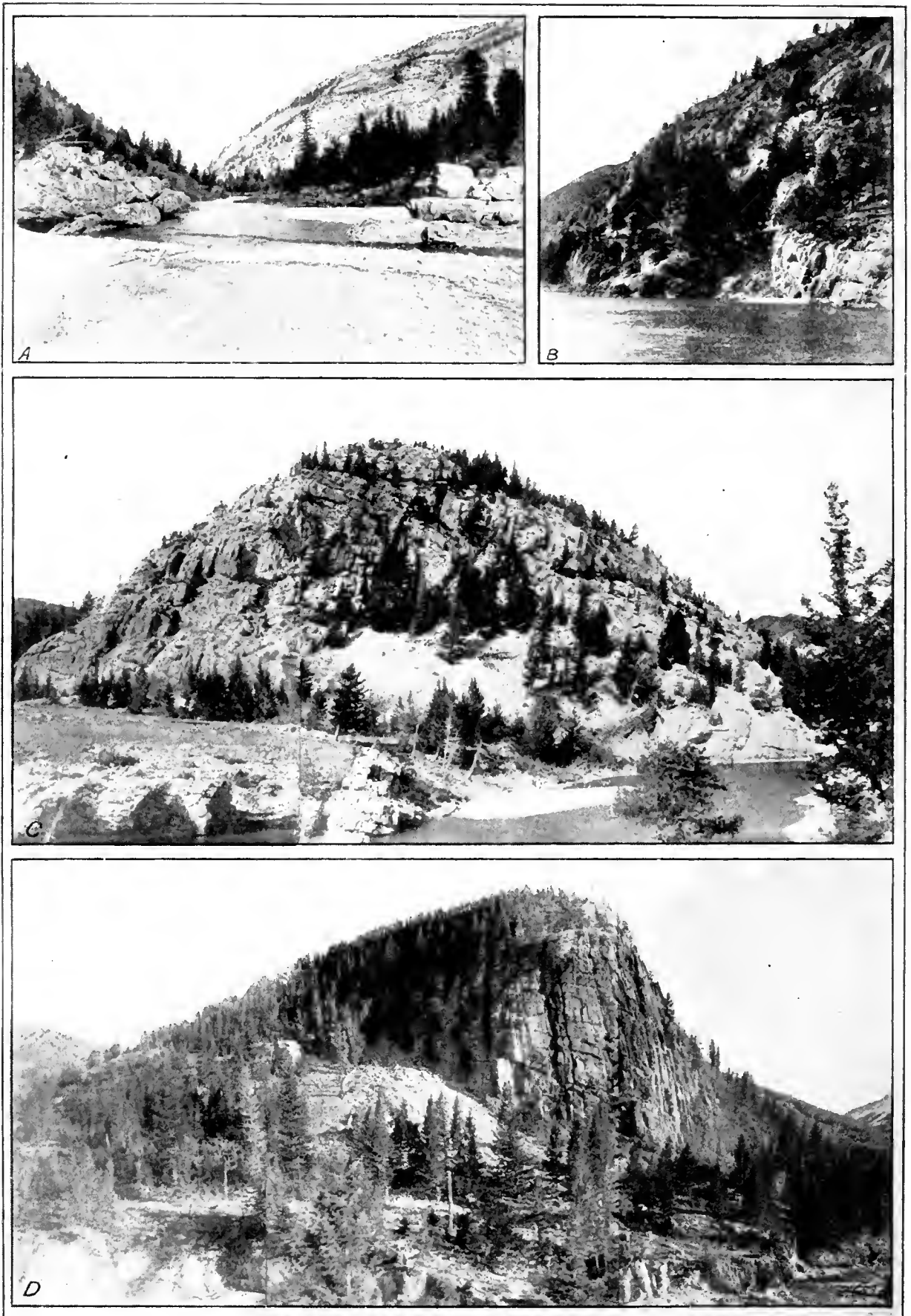
<sup>5</sup> Resident Engineer.

<sup>6</sup> Construction Engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Sacramento Valley	Ellensburg, Wash.	Walker R. Young	Sacramento Valley Development Association and State of California.
Spanish Springs storage	Fernley, Nev.	A. W. Walker	
Owyhee	Boise, Idaho	R. J. Newell	
Vale	do.	do.	Middle Rio Grande conservancy district. State of Utah. State of Wyoming.
Middle Rio Grande	Denver, Colo.	I. E. Houk	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	
North Platte (Casper) pumping	Guernsey, Wyo.	F. F. Smith	
Heart River	Denver, Colo.	G. E. Stratton	
Yakima project extensions	Washington, D. C.	Geo. C. Kreutzer	

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



GIBSON DAM SITE, SUN RIVER PROJECT, MONTANA

A. RIVER CHANNEL, LOOKING DOWNSTREAM FROM GRAVEL BAR ABOUT 250 FEET ABOVE DAM. B. PORTAL SPILLWAY TUNNEL, LOOKING UPSTREAM. C. NORTH ABUTMENT. D. SOUTH ABUTMENT



# NEW RECLAMATION ERA

VOL. 17

OCTOBER, 1926

NO. 10



APPLE PICKING TIME ON THE GRAND VALLEY PROJECT, COLORADO



## THE NEW VISION

*ECONOMIC studies have disclosed the obstacles which confront settlement and farm development, and they have also shown the position which settlement and farm development should hold in any successful scheme of reclamation. Visitors to settlers' homes on new irrigation projects can not fail to realize the economic waste which results from leaving them to struggle without aid and direction to complete the unproductive work of clearing the land and preparing it for irrigation. The more carefully this is studied the stronger is the conviction that much delay in repayment of construction costs, the trials and disappointments of settlers, can be averted by planning settlement and farm development as we have planned the building of irrigation works.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

OCTOBER, 1926

No. 10

## *Interesting High Lights on the Reclamation Projects*

**T**HE low stage of Lake Walcott, Minidoka project, in September was taken advantage of to make needed minor repairs to radial gates and head gates at the Minidoka Dam.

**S**HIPMENTS of agricultural products from the Minidoka project during August comprised 333 cars, 89 of which were of potatoes and 152 wheat.

**T**HIRTY cars of certified seed potatoes have been contracted from Milk River project farmers by the State of Louisiana through the extension department of the State university. Representatives of the State who visited the project recently stated that Montana potatoes are very popular in Louisiana and that it is impossible at the present time to supply the demand.

**T**HE Sun River project is enjoying one of the most prosperous years in its history. The alfalfa crop was better than usual and grain crops were particularly good. Prices are good and expected to go higher.

**W**ORK has begun on the Lower Yellowstone and Belle Fourche projects on signing up land under the uniform option contract.

**T**HE sugar-beet acreage on the North Platte project is the highest in its history, and indications point to an excellent yield, although probably not up to that of 1925, the banner year.

**T**HE people interested in the Fallon sugar factory on the Newlands project have started a campaign of education to interest farmers in planting beets for the 1927 season. Contracts are now being signed for next year's acreage.

**S**HIPMENTS of agricultural products from the Yuma project during August totaled 92 cars valued at \$193,050, bringing the total from the first of the year to 1,990 cars valued at \$1,773,900.

**A**BOUT 900 cars of peaches of excellent quality were shipped from the Palisade section of the Grand Valley project.

**T**OTAL collections from the Strawberry Valley project during August amounted to \$5,174.48, of which \$309.82 comprised construction charges, \$1,317.42 operation and maintenance, and \$3,547.24 power and miscellaneous collections.

**T**HE limited supply of water available on the Yakima project necessitated the closest possible regulation, but very satisfactory service has been possible and there will probably be no crop losses unless possibly in the case of extremely late plantings of potatoes.

**A**PPROXIMATELY 152,000 acres of land in the Yakima-Benton and Kennewick irrigation districts have been mapped under the soil survey. About 15,000 acres remained to be mapped at the end of August.

**E**CONOMIC development on the Yakima project is shown by the following: The Naches Heights Community Club has dedicated a new community club house; Benton County is constructing a new courthouse at Prosser to cost \$75,000; Sunnyside is preparing to construct a \$30,000 sewer system.

**G**OOD progress is being made on the construction of the first 4 miles of the main canal on the Kittitas division of the Yakima project.

**A**T McKay Dam, Umatilla project, all concreting on the face of the dam has been completed, and the spillway gates and lifting devices have been installed.

**A**BOUT 9 p. m., August 22, Robert Herman, age 16, fell into the main canal on the Klamath project just above the intake of the tunnel. He was swept into the tunnel, which has a length of 3,300 feet. Some 15 or 20 minutes later he emerged from the lower end and was rescued, not much the worse from the experience.

**T**HE Powell Creamery, Shoshone project, purchased 13,100 pounds of butterfat during August and manufactured 15,000 pounds of butter and 800 gallons of ice cream. Other agencies purchased 3,000 pounds of butterfat, the price of which at the close of the month was 35 cents a pound in sour cream and 50 cents in sweet cream.

**S**HIPMENTS of cantaloupes from the Rio Grande project comprised approximately 1,000 cars, the average price being 75 cents a crate, making a return of \$200 an acre.

**A**BOUT 20,000 cubic yards of concrete were placed at American Falls dam during August, and at the end of the month it was estimated that only about 4,000 to 5,000 cubic yards remained to be poured in the dam. All excavations for the dam have been completed.

**O**N the night of August 30 the cold-storage plant of the Yakima Fruit Growers Association at Zillah, with a capacity of 750 cars, was destroyed by fire, probably caused by defective wiring.

## The Vale Irrigation Project in Oregon

*The third of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the Sixty-ninth Congress*

THE proposed Vale project contemplates the irrigation of 28,350 acres of bench and valley land lying mainly along the north side of the Malheur River in eastern Oregon, centering around the towns of Harper and Vale, above the present Warm Springs project. No unusual construction features will be required in connection with the Vale project.

### THE IRRIGATION PLAN

The irrigation plan for this project is closely related to that of the Warm Springs irrigation district, which has constructed a reservoir on the Malheur River about 60 miles west of Vale with a surplus capacity over that required for the district lands. One-half of the present capacity of 170,000 acre-feet is to be purchased for the Vale project at a cost of \$8 per acre-foot. The installation of gates on the crest of the dam, which was provided for in the original plan, will permit the maximum water surface of the reservoir to be raised 4 feet and provide an additional 20,000 acre-feet of storage. This additional cost and capacity will be apportioned equally to each district.

### THE DIVERSION WEIR

Water released from the reservoir will flow in the channel of the Malheur River to a point about 1 mile west of Namorf. At this point a simple diversion weir, 12 feet high and 150 feet long, resting on rock, will be constructed. This weir will require 4,000 cubic yards of excavation and 300 cubic yards of concrete. The canal head gates will be set at right angles to the crest of the weir at the left or north abutment.

### THE MAIN CANAL

From this point to the upper end of Harper Valley, a distance of about 6 miles, the main canal will have a capacity of 646 second-feet and construction will be difficult owing to the presence of rock, steep cross slopes, and conflict with the Ontario-Burns branch of the O. S. L. Railroad, which crosses the Malheur River immediately below the proposed point of diversion. The canal will be carried under the railroad by means of a concrete culvert. For approximately 1 mile the canal will follow the north side of the river and will then be carried to the south side by means of a flume 800 feet long, of which 100 feet would be on a steel bridge. For the next 4 miles the canal parallels the

river on the south side to a point which is favorable for a siphon location, and where conflict with the railroad does not occur. At this point the canal is to be returned to the north side by means of a concrete siphon 1,015 feet long. Owing to the difficult territory traversed by the canal a large amount of steel and concrete bench flume will be required. In this 6-mile canyon section immediately below the point of diversion the aggregate length of steel and concrete flumes and siphons will be 14,000 feet.

### THE HARPER TRACT

After leaving the canyon the canal supplies water for the Harper tract. This is an area of 3,735 acres of bench and bottom land north of the Malheur River contiguous to the town of Harper. Across the river from the lower end of the Harper tract is an area of 675 acres known as Little Valley. Water for this area is to be carried across the river by means of a second siphon. This is the only area south of the Malheur River for which works will be constructed.

Separating the Harper tract from the Vale Valley is a canyon about 6 miles in length. The conditions here are very similar to those encountered in the first 6 miles below the point of the diversion. Between the Harper and Vale Valleys the aggregate length of flumes and siphons will be 13,000 feet, in addition to which there is required 572 feet of concrete-lined tunnel 11 feet in diameter. Vale Valley is reached at the end of this canyon, and the main canal thereafter has but one structure of importance, namely, a 70-inch reinforced concrete siphon 6,200 feet long across Bully Creek.

### DRAINAGE

Drainage is expected to be required on only a small part of the total area, principally in the Willow and Bully Creek bottoms.

The surplus storage capacity of the district to be used by the Vale project results from early overestimates of the irrigable area in the Warm Springs district. Seepage encroachments and refractory alkaline soils have reduced the amount of tillable lands in this district until at the present time about one-third of the original area of 37,000 acres classed as irrigable is capable of producing crops. This reduction in area has reduced the resources of the district to such an extent that it is incapable of financing a drainage program. By

the terms of the pending contract for purchase of the surplus Warm Springs Reservoir capacity, the United States will divert from \$150,000 to \$200,000 of such purchase money to provide drainage for the district lands, and without further consideration the Warm Springs district drains will also carry off drainage waters from the higher-lying Vale project lands.

### THE PROJECT COST

The total cost of the project is estimated at \$3,590,000. Of this amount about two-thirds is required for the diversion weir and the main canal and approximately one-fifth for storage. The remainder of the estimated cost is required for laterals and drainage.

By means of a supplemental contract with the Warm Springs irrigation district it has been arranged that this district shall utilize the drainage and return flow from the Vale project lands to the greatest extent possible with the Vale project, receiving Warm Springs Reservoir storage in equal amount in exchange.

The total area commanded by the canals of the Vale project, not including lands now having a full water supply, is 36,000 acres. Soil surveys and a land classification indicates 32,095 acres thereof irrigable, of which 2,776 acres now receive a partial water supply from various sources. With appropriate allowances for rights of way and equivalent areas of full water right in lieu of the area now receiving a partial supply, the net project irrigable area would be equivalent to 28,350 acres receiving a full water supply.—R. F. Walter, Chief Engineer.

### PROPOSED CONTRACT

The form of contract referred to was approved by the First Assistant Secretary of the Interior under date of June 29, 1926. Although the proposed contract has not yet been executed, the following summary of the terms of the contract form, as approved, may be of interest.

The contract provides for the expenditure by the United States of not to exceed \$4,500,000 for (a) the purchase of a one-half interest in Warm Springs Reservoir from the Warm Springs irrigation district, (b) the construction of a diversion dam in the Malheur River in sec. 6, T. 21 S., R. 41 E., Willamette meridian, (c) extending therefrom a canal system consisting of a main canal and branch canals and structures, and (d) the necessary drainage works, as found by the Secretary.

In the construction of these irrigation works the United States is, so far as practicable, to utilize the ditch and canal rights of way reserved in patents for land taken up after October 2, 1888. This right of way is reserved in the act of Congress of August 30, 1890, 26 Statutes, 391, a farsighted enactment which has been of great assistance to the National Government in the construction of irrigation works. The district is to obtain by purchase or condemnation any right of way not covered by the Government's reservations.

Upon the completion or termination of the construction program the Secretary of the Interior is to furnish the district a statement of the total amount of the construction costs payable by the district to the United States under the contract. The district is to pay the construction cost as stated by the Secretary. If water becomes available for any part of the project before the completion or termination of the construction program as a whole, the Secretary is to give notice to the district to that effect, describing the legal subdivisions of land for which water is available, and giving the tentative per irrigable acre construction charge payable by the district on behalf of such completed portion of the project. The construction charges are to be payable in 39 annual or 78 semiannual installments. The last 34 of the 39 annual installments are to be equal installments, but the Secretary has the option to provide in said notice for smaller installments during the first five years. It is well known that during the period when raw land is being subdued to irrigation the crop returns, in proportion to the labor and capital spent, are generally small, and this five-year period of relative low construction charge payments would give the new land time to come into full productivity before the owner is called upon to meet the full annual construction charge installments. Where the per irrigable acre construction charge is announced tentatively, the charge is to be adjusted later when the construction program is terminated. The operation and maintenance or rental charges payable to the United States for the first year after the construction charge notice are to be transferred to and paid as a part of the construction payment.

As permitted by the act of Congress of May 15, 1922, 42 Statute 541, the annual construction charge installments may, if the district so desires, be paid one-half on December 31 and one-half on July 1 following, instead of on December 31. This enables the district to pay the United States soon after the district landowners pay their taxes.

After the completion of the construction program the district is to operate and maintain the works, the United States, however, reserving the right to inspect the works to ascertain whether they are being properly maintained. If the district fails to maintain the works properly the Secretary has the option to do needed repair work and charge the cost to the district. The landowners are in all cases to pay operation and maintenance charges in advance.

One of the most important articles in the contract form is that providing for what is known as joint liability and reading as follows: "The district as a whole is obligated to pay to the United States the full amount herein agreed upon according to the terms stated, regardless of individual default in the payment of any assessment levied by the district."

Should the district refuse or fail for a period of more than one year to make any payment due the United States, the Government may refuse to deliver water to the district and may take over the control of the irrigation works for that purpose. The district is to refuse the delivery of water to any land the owner of which is delinquent for more than one year in the payment of his charges.

Until the construction charges are paid in full the district is to employ an irrigation manager who is acceptable to the Secretary of the Interior.

It is a cardinal principle of the Federal reclamation laws that the money of the Government is not to be used for the enrichment of a few large landowners. To carry out this principle two important provisions have been incorporated into the proposed contract, one prohibiting

the delivery of water to more than 160 acres of irrigable land in a single ownership, although the excess is assessable as if water were being delivered, and the other providing that an owner of land in the district is to agree that if he sells the land at a price in excess of a fair market price as fixed by an appraisal approved by the Secretary, one-half of the excess is to be turned in upon the project charges. These matters, the drift of land into large ownerships, and the rise and fall of land values are admittedly difficult to control, being as they are a phase of the economic life of the country, but it is hoped that these provisions, and particularly the latter, will aid in preventing those who are to make homes on the irrigated land from loading themselves up with debt for the purchase of their land during periods when land values are unreasonably high.

As stated above, the United States, as a part of the proposed project, is to purchase a half interest in the Warm Springs Reservoir. The Warm Springs irrigation district embraces land in the valley, whereas the land that the Government is to reclaim lies at a higher elevation. On September 14, 1925, the Interior Department approved a form of contract for the purchase of a half interest in the Warm Springs Reservoir from the Warm Springs irrigation district. The contract involves a sale of what might be described as a vertical right in the reservoir; that is, after the sale, if there is a shortage of water stored in the reservoir, the owners of land in the Warm Springs irrigation district are to share the available water supply with the United States. An act of the Legislature of Oregon was passed to facilitate the sale, and the court confirmed the sale as legal and valid. Later certain landowners in the district who had defaulted in the confirmation proceedings brought a suit to enjoin further proceedings to effectuate the sale. They alleged among other things that the water rights in the reservoir were owned by the individual landowners in the district, and hence that the district could not make a valid sale of this property. This second case was carried to the Supreme Court of the State, where the power of the district to continue with the proceedings looking to the sale of a half interest in the water rights of the Warm Springs Reservoir was upheld. (*Johnson v. Warm Springs Irrigation District*, 246 Pac. 527.)—Legal Division.

### *Pacific Conference Includes Reclamation*

*Secretary of the Interior Work, with the approval of the President, has designated the week of April 11 to 16, 1927, as the date for the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, to be held at Honolulu, Hawaii.*

*The general purposes of the conference contemplate a mutual discussion of common problems relating to schools, reclamation, rehabilitation, and recreation. It is hoped that the conference will prove a medium for better understanding and relationship between the United States and its neighbors in the Pacific, and will strengthen the Territorial administration in Hawaii and other Territories.*

Selecting sweet-potato seed at harvest time will enable the grower to note the yield per hill, the relative size and shape of the potatoes, and the presence or absence of disease.



## Community Land Settlement in the Southern States

*The Department of the Interior is seeking tracts of land in any part of the South preparatory to field investigations, with a view to engaging the joint efforts of the Federal and State Governments in community land settlement*

*By Copley Amory, Expert in Reclamation Economics*

THE Sixty-ninth Congress appropriated \$15,000 to "obtain necessary information" through the Department of the Interior "to determine how arid and semi-arid, swamp, and cut-over timberlands in any of the States may be best developed." Heretofore reclamation has been confined to the irrigation of arid lands.

This step expands the field of reclamation to any State in which the progress of agriculture requires Government direction. It marks a new stage in the agricultural development of the United States. In the older countries of Europe this stage was reached long ago, and in those countries, notably Denmark and Holland, the success of government direction of land settlement has justified its application.

Heretofore the course of land settlement in the United States proceeded upon the theory that, given opportunity for taking up land, the farmer does the rest.

### RECLAMATION JUSTIFIED

In the 24 years which have passed since the passage of the reclamation act Mr. Roosevelt's policy of reclamation has been justified many times over in the result of its application to western arid lands. It does not follow from this that the original policy has not required modification in many particulars or that failures of whole reclamation projects or failure of many farmers on several reclamation projects have not taken place. But the modification in the cost of living in those Western States where the projects have been installed has been a tremendous stimulus to the development of those States.

The process of land settlement is being investigated by the Department of the Interior in that part of the Nation where the decay of agriculture has proceeded most and where its continued progress threatens the most harm. This obviously is the southeastern cotton States.

It is not broadly understood as to what extent the boll weevil, the economic effects of war and the resulting exodus of the negro, and the drain of the recent Florida development upon all classes of farmers have affected some or all of the Southeastern States.

Cotton is the staple crop of the South. Efforts to introduce diversified agriculture

and raising the food supply of the State within the State have proceeded only partially and but slowly.

Mr. N. L. Willett has commented as follows on this situation:

Clemson College the other day told us that the average South Carolina cotton farm in the past five years has given an outturn of only 150 pounds of lint cotton per acre, and that at 18 cents or 20 cents for cotton, this outturn would not pay the farmer out. This means that at present the average cotton farm in the South Atlantic States is practically a liability and not an asset. And so long as our system of farming obtains and so long as we are not increasing crop outturn per acre, why, the above situation is getting worse rather than better.

\* \* \* \* \*

The South Atlantic farmer, too, at one time had cotton under his control. He had no competition, but to-day he faces one of the most serious competitions that one could imagine. To-day India, Egypt, Sudan, South Africa, and China are fast increasing cotton acreage. India to-day grows over 5,000,000 bales of cotton. At one time the cotton business was on this side of the Mississippi River. To-day over half the cotton crop is made in Texas, Oklahoma, and Arkansas. There they plant two rows of cotton at a time, use practically no hoes, and plant continuously in the row without chopping. They have, too, practically no weevil and they use no guano. They thus grow cotton very much more cheaply than we can do it here. Furthermore, the cattleman in Texas is fast going out of the business, and all grazing lands in west Texas are either now in cotton or are headed that way. To-day these three above States plant 25,000,000 acres of cotton, and Texas alone plants 17,000,000. Thus is competition affecting very tragically the cotton status here in the South Atlantic States, and this competition is growing larger every year.

\* \* \* \* \*

There is no doubt, and aside from the foregoing, but that the South Atlantic cotton farmer operates under very certain and sad handicaps. We plant, for example, long-spaced cotton. We hoe, we cultivate only one row at a time, and much of our cotton is  $\frac{7}{8}$  inch in place of 1 to  $1\frac{1}{4}$ . The Southwest is herein more efficient and economical than we are. We here, too, use almost exclusively the share-cropper system. Clemson College is authority for saying that more than one-third of them move every year. Now, under a one-year tenantry no agriculture certainly can progress, even

if it keeps its head above water. One-year tenantry prevents all soil upbuilding and farm improvements. One-year tenantry, in fact, means the continuous depletion of soils. It is our one-year share-cropper tenant that dominates our choice of crops and its cultivation. The tenant herein wants nothing save the cotton farm, and, to begin with, he knows nothing else than that.

The Department of the Interior is seeking tracts of land in any part of the South preparatory to field investigations, with a view of engaging the joint efforts of the Federal and State Governments in community land settlement.

Commissioner Mead has described what land settlement is and what is to be hoped from it in a recent article from which we quote.

Speaking of the Durham Community Land Settlement in California inaugurated by himself, Doctor Mead says:

By mobilizing the expert knowledge of the State in the planning of this settlement, by taking advantage of the experience of other countries in working out the interest rate and the length of time given for payment, by helping the settlers to cooperate in business and social affairs, the hundred farms and the 40 farm laborers' homes at Durham have become a landmark in rural progress that has attracted experts from more than 30 widely separated countries. After a lapse of five years it is a firmly established going concern. The farmers are meeting their payments on land and also the advances made to enable them to live in comfortable houses, own good stock, and work with good tools. The comfort and convenience of the farm laborers' homes and the willingness of their owners to do all kinds of farm work have been a revelation to those who thought the American farm worker had degenerated.

### A DEMONSTRATED SUCCESS

These farm laborers take part in all the cooperative activities of the settlement; their families share in the social life on an equality with the farm owners' families. Many of them will be farm owners in the future. The Durham colony is very like the American school district of my boyhood. There is the same civic pride in the community; the same interest in education and community affairs. It has, however, a better land tenure and better organized community activities. These can not be broken up by the purchase of farms by nonresidents. Until the farms are paid for, only people who live on them are permitted to become

owners. If speculation had not been thus eliminated, half of these farms would be owned to-day by merchants and capitalists of the Sacramento Valley.

California and the two Carolinas are among the agricultural States that have begun constructive measures to help men become farm owners. In North Carolina 22,000,000 of the State's 31,000,000 acres are unimproved. Only 8,000,000 are cultivated, and among the cultivators are 117,000 landless farmers. These tenants and croppers follow a primitive and destructive kind of cultivation. They take everything out of the soil and put little or nothing back. This has brought low yields, which, joined to a drab, monotonous life, are causing a wholesale exodus of both white and black farmers. The drift is in the wrong direction and needs to be changed. If the State could bring its good land under cultivation it would add \$400,000,000 to the yearly value of farm products. But such results will come only through constructive action, based on the idea that land settlement is a public question.

### WHERE THE COLONIZER FAILS

In order to bring back these departed families, rural life must be made socially attractive. The easiest way to do this is to create communities where the people will be helped to act together in business and social affairs. The restoration of these idle and neglected fields requires group settlement, each farmer owning his land but touching elbows with his neighbors in many helpful ways.

The lure of farm ownership must be also held out. Money must be provided to help settlers buy and improve their patches of land and equip them so that they can be properly cultivated. That needs the best kind of oversight and far more money than private colonizers are willing to furnish. That has been proved in North Carolina by the failure of many colonies where the land buyer was left to hoe his own row. The colonizer usually is a land salesman only. His interest ceases when the purchaser signs on the dotted line. The sale of the land must be the beginning of responsible oversight in the colony of the future.

### THE END OF THE PIONEER

What justifies the abandonment of the heretofore policy of land settlement which has governed the colonization of the continental United States? In Commissioner Mead's words:

The nineteenth century marked the end of the American pioneer. Within its span the frontier moved west from the Alleghenies to the Sierras, where it met the older Spanish civilization of the Pacific coast. It created a life and types of character crude but attractive, and distinctively American. The cowboy and plainsman, two of the most dominant and self-sufficient figures of our history, are already shadowy figures of the past.

Pioneer life ended with the frontier. Equally significant but less colorful changes in rural life took place in the expanding region back of the frontier. The farmer of the first two-thirds of the nineteenth century was a jack-of-all-trades. He was both producer and manufacturer. The country neighborhood was largely self-supporting. The farm bread was made from flour or meal ground from his own grain at a community gristmill. He fattened and slaughtered the hogs that filled his pork barrel. A few sheep furnished the wool for his clothes the cloth being made at a local woolen mill or at an earlier date on the farm. In my boyhood I spun yarn and wove cloth on wheels and looms inherited from my grandfather's larger equipment.

All that is gone. The shrewd and resourceful men of the cities reached out and captured the business, the arts and industries of the farms, and the country neighborhoods. Farm life became less varied, offering fewer interests to its youth, and the more active and enterprising inhabitants followed the tannery, the grist and woolen mills to the city.

Those who took part in this rapidly changing life thought only of the present. Very few realized that as pioneers they were laying the foundations of a future civilization or that they were trustees of resources which had been so recklessly placed in their improvident hands.

### DESTRUCTION THAT FOLLOWED THE PIONEER

The enormous wealth of land, mines, and forests made the pioneer and his followers migratory, improvident, and speculative. He robbed the soil of its fertility by the most exhaustive forms of cultivation known to man.

He grew corn for which there was no home market, and sold it to Europe for less than the phosphates and nitrates the crop had taken from the soil were worth as fertilizers.

My boyhood was spent on the banks of the Ohio River. The hills which border it had the most magnificent growth of hardwood timber the world has ever seen. Oak, ash, hickory, walnut, poplar, and wild cherry were among the splendid trees that reached straight and tall toward the skies. I saw them disappear like mists before the morning sun, cut down and burned to enable corn and tobacco to be grown. These crops have no binding material in their roots. Planted on steep hillside slopes, the winter rains soon washed away the fertile surface soil which it had taken nature unnumbered centuries to create, and left them scarred with gullies covered only with weeds and brush.

If those hillside forests had been preserved their beauty alone would be a national asset of untold wealth. The land was not needed for cultivation. Our activity was destructive, but I do not recall a single expression of regret. Everyone under 40 expected to move farther west and share in the Nation's bounty of free fertile land. Kansas or Arkansas was the promised land of our community.

Doctor Mead's contemporaries moved on to Kansas and Arkansas and their successors in turn to the western limits of the continent, no better conservators than their forbears. Their improvidence "as trustees" of those vast agricultural resources which "had been recklessly placed in their hands" has raised for us the question of which in part the solution may be community land settlement.

It is fair and pertinent to say in passing our judgment upon these "trustees" of our decaying agricultural resources that the system which they followed and which we in part condemn, while it was "reckless" and wasteful, did not utterly and wholly destroy the value of the great agricultural asset intrusted to them. As to a part of it some agricultural value remains and some they converted, by wasteful methods it is true, into wealth of other sorts. They liquidated a large proportion of the plant food value of our soils and in so doing converted a part of its value into other forms, as railroads, bridges, and buildings, which remain to contribute to the national income.

In the next ERA I will endeavor to show what farm life in this new era of farm history must be and how far this ideal has been attained in North Carolina.

Selected sweet-potato seed should be stored in baskets or crates, in a part of the house where they will not come in contact with the general stock.

## Reclamation Economies Bring Saving of \$84,000

The personnel of the Bureau of Reclamation was reduced by 34 permanent employees during the current fiscal year, according to an announcement made at the Interior Department recently.

The reduction was brought about through the relinquishment by the bureau of the operation and maintenance of a number of Federal irrigation projects and divisions which were turned over to the water users. The projects affected were located in the State of Idaho and included several divisions of the Boise project, the King Hill project and the south side pumping division of the Minidoka project. In addition the services of a number of employees were dispensed with by the sale of the Williston project in North Dakota, its operation having ceased with its disposition. Savings as a result of this reduction in personnel amount to approximately \$84,000 annually.

## Engineering Required in Farm Development Under Irrigation

*The work of the engineer should not stop with the construction of the major works.—Much can be done for the individual water user to prevent mistakes in planning his laterals, laying out his roads, and properly locating his farm buildings*

*By R. F. Walter, Chief Engineer, Bureau of Reclamation*

**I**T is the general conception that upon completion of the canal and delivery of ample water at sufficient elevation above the highest point of the land to be irrigated, the settler should easily be able to successfully do the rest; that no further attention of the engineer is required, and he should move on to other works to be constructed. This may have been possible 50 years ago, but conditions have changed.

### SIMPLE METHODS OF THE PIONEER

The pioneer diverted the water from the stream by his simple methods and mostly with his personal labor, with little outlay of cash required. He had little or no money or credit. Perhaps some simple surveys were made or levels established, but generally he located his ditches by following the water. In fact, employment of a surveyor was often not necessary, even if one was available. In the adjudication proceedings instituted on the Big Thompson, one of the first streams to be diverted for irrigation in Colorado, some 40 years later, ex-Governor Brush, who made the first diversion therefrom, testified that he weighed out \$300 in gold dust to pay a mining engineer to come from Golden, Colo., about 100 miles away, to survey this ditch. The ditch

diverted water at the grade of the stream, was 3 miles long on a straight line, cutting across an ox-bow bend in the stream, and was found to have a grade of 16 feet per mile. As no map was made, I have often wondered what this surveyor did for the gold dust.

Upon exhaustion of these simple opportunities, the settlers combined their efforts and constructed more difficult diversions, still mostly with their combined labor and with little need for money.

### WASTEFUL COMMUNITY EFFORTS

Then followed the more difficult diversions requiring investment of capital for construction of community canals to irrigate larger areas, but even then the settler received his water at the main canal, often several miles away, and built his own lateral leading from the canal to his land, or in conjunction with his neighbors, depending on the difficulties encountered or the readiness of his neighbors to join him. These early laterals were generally built without surveys or previous planning and, as in the first case, mostly with the individual labor of the settlers. Except where labor was employed and paid for, they were figured without cost, and, in fact, \$1 per acre was the exceptional rather than the usual cost. As may be

expected, without prior planning, these early constructed laterals, after land became more valuable, created a great source of damage to the land, by washing great gullies where excess grade was not properly taken care of and by seepage where grades were uneven or insufficient. Many of these laterals have since been combined, relocated, and reconstructed, but the results of the early damage often remain.

These early laterals were generally built without consideration for right of way and were continued by sufferance until a right by use was acquired and it was then difficult to force the owners to relocate or improve them, as the damage was often not incident to the land of the owners. I know of one old irrigation system in the South Platte Valley—the Farmer's Independent Canal, said to be so designated for the reason that each farmer constructed and maintained an independent lateral to his land. I have seen as late as 1905 as many as eight parallel farm laterals leading through highly cultivated farms, where but one main lateral was necessary. The damage to the land adjacent, from accumulation of weeds and from seepage, to say nothing as to the loss of water and value of the land used, often represents an amount equal to many times the original cost of a well-located and properly constructed lateral system.

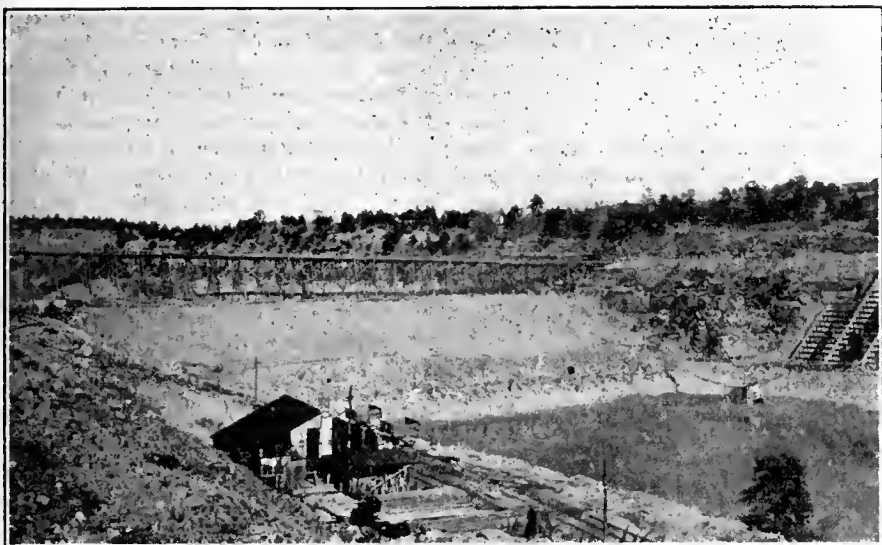
### THE ERA OF LOGICAL PLANNING

Not until the Reclamation Service, in connection with the construction of irrigation projects under the reclamation act, found that many of those ready to irrigate their lands would be delayed in getting the water from the main canals to their lands, on account of the inability of some and lack of initiative of others of their neighbors in financing or joining in the construction of the community lateral, and for this reason the project development was being greatly retarded, did the construction of reclamation projects provide for the logical planning and construction of the lateral system and delivery of water at the land.

The additional cost has been considerable, but I believe those who have given this study, including the water user who must eventually pay the bill, generally agree that the results have justified this program.



Chief Engineer R. F. Walter makes a few remarks to help celebrate the beginning of construction of the Kittitas project, Washington



Progress at Guernsey Dam on the North Platte project, Nebraska-Wyoming

### MORE AID TO SETTLERS NEEDED

Even with the construction of the lateral system, the settler has been expected to work out his own salvation after the water is delivered to his land at an elevation sufficiently high to provide a sufficient grade to carry the water to the high point to be irrigated on his farm and in general little or no aid, or only incidental advice, has been furnished him and he has been left to his own resources in planning the best method of irrigation, selection of crops to be grown, building his improvements, and construction of his farm and waste ditches, etc., in all of which it has been found that he needs additional advice and information unless he be, as few of our settlers are, an experienced irrigator.

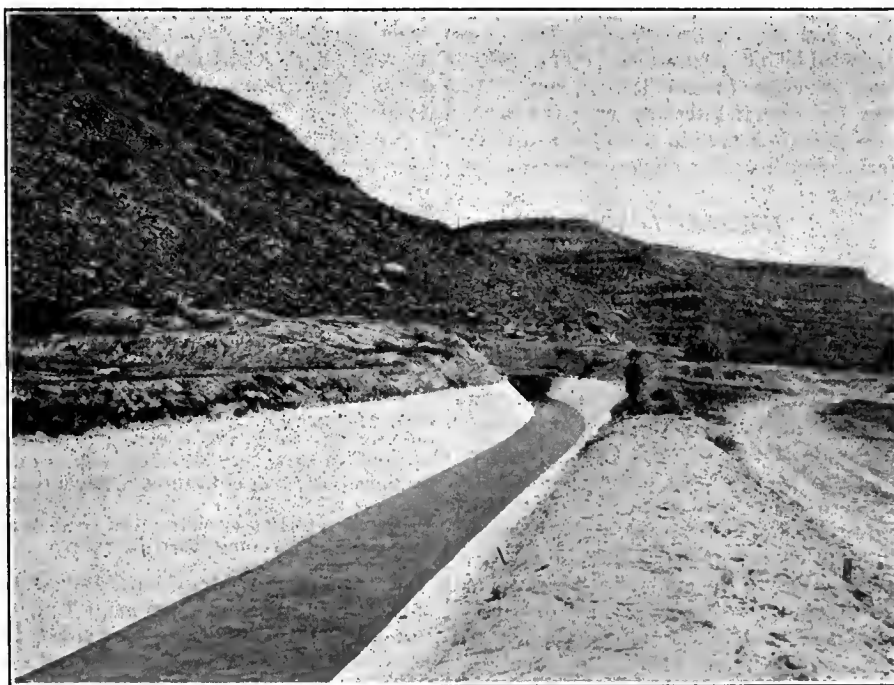
Where large tracts of vacant Government land, or, by the agreement of the owners, large areas of privately owned lands, are to be opened for irrigation, the farm boundaries should be established with due reference to topography and to physical features, either constructed or to be constructed, where the location thereof can be anticipated in advance. This, of course, is generally not possible where Government lands are interspersed with private lands held in small ownerships, the boundaries of which are defined in accordance with the lines established under the rectangular system of surveys of the General Land Office. In the subdivision of such tracts and establishment of farm boundaries, farms should include lands having, as much as possible, a similar direction of slope so as to permit irrigation from one head lateral and avoid the necessity for more than one delivery to the farm and for the disposal

of waste water without damage to adjacent farms. Endeavor should also be made to include land having similar topography, so that the same method or system of irrigation can be used on all the land. They should be so established as to avoid as much as possible the interference of highways, railroads, main canal and lateral lines, and drains, and with such physical features and topography for boundaries rather than the arbitrary section and subdivisional lines. These boundaries should be plainly marked so as to avoid encroachment on canal or drain rights of way required for future maintenance. Special surveys will, of course, be

required for description and conveyance purposes, as well as for computing the total and irrigable areas.

### ENGINEERING SERVICE FOR NEW SETTLERS

The settler should be furnished with a plat of his farm, upon which is shown the location and sizes of the needed ditches to convey water to the various fields. It should also show the system of irrigation to be followed to apply the proper amount of water to these fields with a minimum of expense for leveling and a maximum of convenience for the future operator of the farm. It can be readily understood that different types of soil and different character of topography will require different methods of irrigation to get the highest results. One field can best be watered by field laterals following the slopes; in other cases the laterals should be on contours and distribution completed by making shallow furrows; in still other cases, borders or ridges should be thrown up at intervals of from 30 to 50 feet apart as guides for the water, which is applied to the plants between the ridges by flooding. The determination of the method of irrigation to be used is an engineering problem requiring not only a knowledge of hydraulics but also a knowledge of soils. If these plats are made before the raw land is developed, and some engineering service extended to the new settler so that he carries out the plan, the settler can be saved from costly mistakes. The inexperienced settler does not understand a contour plat, such as is made of the irri-



Tunnel and lined section, High Line Canal, Grand Valley project, Colorado



gable land before the project is constructed. And, even if he does, the contour interval is usually 5 or more feet and the scale too small to be of much use in planning irrigation methods, leveling of the land to conform thereto, or the construction of the farm or sublaterals. He will often use the common method of "cut and try," which generally means to make the cut and try to dispose of the material as best he can.

### MISTAKES OF IRRIGATION

Not long ago I observed a settler on one of our projects who, without surveys, had been working for weeks with several teams trying to level off a small hill which was above the general level of his land, and which could have been irrigated at one-tenth the cost by constructing a little inexpensive dike in his lateral. If he had known the amount of work involved, or been properly advised in advance, he could have saved himself much labor, greatly needed for leveling the balance of his farm. Upon my remark to him that such leveling costs a lot of money, he replied "No, it don't cost anything but it takes a heap of work."

Small structures, such as turnout gates in head ditches, culverts, and checks, require different designs to fit different conditions. Too often they are made too small and frequently they are washed out. Farm ditches should also be designed to carry the proper amount of water to irrigate the fields to be served by them. Too often the farm ditches are too small. Siphons which carry water under depressions can only be properly designed by a knowledge of hydraulics. Very often they are either too small or too large. In the first case it interferes with the farmer's operations, and in the second case the farmer spends more money than is necessary.

### THE FARM LAYOUT

To properly develop a farm requires a knowledge of sanitation. The drainage from corrals and barns should be taken care of so that the water will not pollute the domestic water supply. The house should be built at such an elevation so that sewerage can be disposed of through a septic tank. Septic tanks for the disposal of sewerage are recognized in modern farm sanitation, but a septic tank can not be installed if the house is built in low ground and there is no way of disposing of the effluent. These tanks are designed to meet varying conditions and may be built of different materials that can be found cheaply in the local community.

The farmstead layout probably is the least planned of anything on the average farm. There is no relation between the location of the house, barn, poultry house, hog house, well, silo, feeding corral, home garden, or family orchard. All of these have their proper place and as much skill can be used in the proper location of these buildings and conveniences as is utilized by a good architect in planning a convenient kitchen. A farmstead, to be properly planned, should have beauty. The best results are obtained when this is planned by an engineer who has studied the problem.

### FARM ARCHITECTURE

The design of farm buildings requires engineering and architectural skill, first, to meet the requirement of the family and livestock and, second, to obtain the best structures for the amount of money expended. In this division of engineering beauty of design should not be overlooked. I have seen small buildings designed for new settlers that were ultimately to be their garages but, in the beginning, were

## South Africans Express Appreciation

During August Mr. H. R. Roberts, of the Irrigation Department of the Union of South Africa, and Mr. D. G. Collett, chairman of the Irrigation Board of Graaff Reinet, South Africa, visited the Rio Grande, Yuma, Yakima, Boise, and American Falls projects. On their return to New York Commissioner Mead received from them the following joint letter:

On completion of the fine scheduled tour prepared for us at your office at Washington, we wish to express our great appreciation and thanks not only to the head office but to all concerned who were responsible for making our trip so interesting and successful.

We met with the greatest courtesy and consideration wherever we went and could not help noticing the fine esprit de corps and loyalty to heads of department prevailing everywhere.

We were much impressed by the work undertaken and successfully carried out, and by the bold and courageous policy of your department, also the admirable transport facilities obtaining at the various projects.

We regret that we have not been able to meet you on our return journey.

At their request Mr. George P. Oettle, of the South African Government Tourist Bureau, New York City, forwarded to Doctor Mead a number of booklets relating to travel in South Africa.

used for dwellings. The windows from the garage would be moved into the house, when it was built, and the fixtures in the small building were made movable. If engineering skill and service is attached to the building program of a new development, the settlers will get more for their money and have conveniences that unplanned buildings do not give. It is equally true that the same skill and knowledge is needed to plan barns and other outbuildings.

### PROPER LOCATION OF ROADWAYS

Highways should be provided, where possible, on the upper side of canals or laterals, to avoid construction of lateral bridges and road crossings and where they will be provided with the best grade. Likewise, roads will have to be constructed through the farm in order to serve all of the fields. These should be located with the same objects in view. There is nothing worse than to find farm roads located in the portions of farms that become flooded from the run-off of water, which makes them impassable during the growing season. This can be avoided by proper planning.

### HOUSEHOLD WATER SUPPLY

One of the most important things is an adequate and proper supply of domestic and stock water. In some places this is easily obtained; in others, it is more difficult. In some sections of the West the underground waters are alkaline and unfit for use. It becomes necessary, in such cases, to construct cisterns which should be so located as to be free from pollution and at the same time convenient for household use. In recent years use has been made of pressure systems to put water in the house and in the corral, thus saving a great deal of hand labor. There is a proper size of pressure system to meet the need of a family and the livestock. Money can be saved when this is well planned.

### FINANCIAL AID IMPORTANT

The existence of an intermediate finance association to aid new settlers without ample means for development can aid greatly and be of the further service to the settler if, combined with their other activities for which organized, they will provide the materials required by the settler, such as fence posts, barbed wire, lumber, paint, and cement, in order that such may be furnished him, in lieu of cash loans, at wholesale prices and eliminate middlemen's profits. This will also make the funds of the association go that much farther.



## Recent Federal Irrigation Legislation

### Passed by the Sixty-ninth Congress

#### BOISE PROJECT, IDAHO

For continuation of construction incidental to the removal of slides and canal relocation, Riverside Canal, Riverside irrigation district, and incidental operations, including the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1926, fiscal year 1927, \$50,000, to be paid out of the reclamation fund.—Public, No. 492, approved July 3, 1926.

#### YUMA PROJECT, ARIZONA-CALIFORNIA

To reimburse the reclamation fund for all costs incurred prior to March 3, 1925, and paid from the reclamation fund, for the operation and maintenance of the Colorado River front work and levee system adjacent to said project, as authorized by section 16 (a) of the act entitled "An act authorizing the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," approved March 3, 1925, fiscal year 1925, and prior fiscal years, \$637,336.

For operation and maintenance costs of the Colorado River front work and levee system adjacent to the Yuma irrigation project, Arizona-California, as authorized by section 16 (b) of the act of March 3, 1925, fiscal year 1926, \$50,000, to be transferred to the reclamation fund and to be expended under the direction of the Secretary of the Interior.—Public, No. 492, approved July 3, 1926.

#### COLUMBIA BASIN

For completing investigations of the feasibility of irrigation by gravity or pumping, water sources, water storage, and related problems on the Columbia River and its tributaries, including the Columbia Basin project, as provided for in the act approved April 13, 1926, entitled "An act authorizing the Secretary of the Interior to cooperate with the States of Idaho, Montana, Oregon, and Washington, in allocation of the waters of the Columbia River and its tributaries, and for other purposes, and authorizing an appropriation therefor," fiscal years 1927 and 1928, \$25,000.—Public, No. 492, approved July 3, 1926.

#### COMMISSION ON THE EQUITABLE USE OF WATERS OF THE RIO GRANDE

The appropriation of \$20,000 made by the second deficiency act, fiscal year 1924, for the expenses of a commission to make a study of the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, and continued available until June 30, 1926, by the "second deficiency

act, fiscal year 1925," shall remain available until June 30, 1927.—Public, No. 492, approved July 3, 1926.

#### SNAKE RIVER APPORTIONMENT

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the consent of Congress is hereby given to the States of Idaho, Wyoming, Washington, and Oregon to negotiate and enter into compacts or agreements providing for an equitable division and apportionment among such States of the water supply of the Snake River and of the streams tributary thereto.

SEC. 2. Such consent is given upon condition that a representative of the United States from the Department of the Interior, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into.

SEC. 3. No such compact or agreement shall be binding or obligatory upon either of such States unless and until it has been approved by the legislature of each of such States and by the Congress of the United States.

SEC. 4. The right to alter, amend, or repeal this act is herewith expressly reserved.

Approved, July 3, 1926, Public, No. 475.

#### RECLAMATION AND DEVELOPMENT OF MISSISSIPPI SWAMP LANDS

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of the Interior be, and he is hereby, authorized and directed to have an examination and investigation made of the swamp and overflow lands on the Yazoo, Tallahatchie, and Coldwater Rivers in the State of Mississippi, with a view to determining the area, location, and general character of the swamp and overflow lands in the valley of the Yazoo River and its said tributaries, which can be developed and reclaimed at a reasonable cost, and the character, extent, and cost of a reclamation and development system of the swamp and overflow lands along the Yazoo River and its said tributaries.

SEC. 2. That the said Secretary shall report to Congress as soon as practicable the results of his examination and investigation, together with a recommendation as to the feasibility, necessity, and advisability of the undertaking, and of the participation by the United States in a plan of reclamation in connection with the development of the swamp and overflow lands in the valley of the said Yazoo River and its tributaries.

SEC. 3. That the said Secretary shall report in detail as to the character and

estimated cost of the plan or plans on which he may report.

SEC. 4. That the said Secretary shall also report as to the extent, if any, to which, in his opinion, the United States should contribute to the cost of carrying out the plan or plans which he may propose; the approximate proportion of the total cost which should be borne by the various drainage districts or other public agencies now organized or which may be organized; the manner in which their contribution should be made; to what extent and in what manner the United States should control, operate, or supervise the carrying out of the plan proposed, and what assurances he has been able to secure as to the approval of, participation in, and contribution to, the plan or plans proposed by the various contributing agencies.

Approved, July 3, 1926, Public, No. 517.

#### HAWAIIAN CONFERENCE

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the President is hereby authorized and requested to call a conference on education, rehabilitation, reclamation, and recreation, to be held at Honolulu, Hawaii, in April or May of 1927; and to extend invitations to such Governments as in his judgment should be represented at the conference.

The Secretary of the Interior, subject to the approval of the President, is hereby given full authority for the inauguration and maintenance of such conference, the preparation of and sending necessary exhibits thereto, purchase of necessary supplies and equipment, for telephone, telegraph, or cable service, freight and express charges, for travel and subsistence of employees of the Interior Department or representatives thereof, and for other necessary expenses incident to the conference, including the employment of assistants in or outside of the District of Columbia, the sum of \$20,000 is hereby authorized to be appropriated, from any money in the Treasury not otherwise appropriated, to be immediately available and to continue available until December 31, 1927.

The Secretary of the Interior shall make a report of the proceedings of the conference and a detailed statement of expenditures to the Congress of the United States at the session next following the conference.

Approved, July 3, 1926, Public Resolution 45.

The 1927 Interior Department appropriation act carried an item of \$15,000 to provide for the cooperative investigation of the reclamation of swamp and cut-over land and the development of agricultural communities or settlements.

## Reclamation Project Women and Their Interests

By Mae A. Schnurr, secretary to the commissioner and associate editor, *New Reclamation Era*

### Help Yourself and Posterity—Plant Shade Trees

**I** WONDER how many of the readers of this section gave second thought to the item at page 96 of the June issue, "Beautifying the Project Home Surroundings." This, like succeeding items and articles on trees and shrubbery, is designed to stimulate interest in the subject. It would be our delight to learn of any combined effort on the part of the project people to urge the planting of shade trees in particular. Plant them around the house and grounds; beautify your approaches by lining your highways with trees.

#### HOW TO PLANT TREES

In planting a tree the first consideration is the kind of soil in which the trees must grow, the climate, and the species that will thrive. Thought must be given to the location of the tree, the space it will have in which to develop, and the variety that grows best in the vicinity. It is well, also, to consider whether it is not better to plant trees of long life, such as the oak or sycamore, instead of trees like the silver maple or poplar that mature after a short span of life. Whatever the choice of the tree, it is deserving of careful thought.

It may be that in near-by wooded sections there are many young trees, saplings, or evergreens. This, of course, makes an easy source of supply, with the advantage of obtaining trees that live well in the vicinity. Experience shows, on the other hand, that it is often more satisfactory to buy nursery trees especially raised for transplanting.

#### PREPARING FOR PLANTING

Once the problem of selecting the proper trees has been solved, there come the details of preparing for planting. Care must be taken of the trees. The roots must not be bruised or allowed to dry, and moist earth should be kept around them until just before they are put in the ground. This is extremely important, because of a few moments of ill-advised exposure of the roots to the sun, wind, or dry air will injure the future of the tree. If the trees arrive with broken or bruised roots, these should be pruned, and at the same time the top of the trees can be shaped up. The pruning should be done cleanly with a sharp pruner.

#### WHEN TO PLANT TREES

There are supporters of both spring and fall as the time for planting deciduous



Picturesque sidewalk in one of our project towns

trees. Both have good arguments. If one were to lay down a general rule, however, it would be safe to say that all trees except evergreens can be planted at any time during the period between their going to sleep in the fall and awakening in the spring, and when the ground is not frozen. In the Northern States the early spring is the best time for the inexperienced planter. Evergreens can be put into the ground in the late spring and during the latter part of September and the 1st of October.

A cool and cloudy day is the best for planting. In preparing the hole for the tree it should be made large enough to hold the roots extended normally. It should be deep enough for a 6-inch layer of good loam before the roots are put in. The soil should be carefully worked around the roots. No air spaces should be left, and it is well to soak the soil around the roots so that the tree will stand firmly. Most trees should be planted 2 or 3 inches lower than in the nursery.

There can be no fixed rule for spacing trees. Along streets they will range from 30 to 80 feet apart, depending upon the variety used. Except along highways, it is best to plant trees fairly near together, and the ones that crowd can be cut out later. In field planting spacing of 6 by 6 feet apart each way is generally adopted. This means 1,210 trees per acre.

If the tree planter has not pruned his tree before he put it in the ground, it should be done immediately afterwards. Frequently there is too little rather than too much pruning at the top. The tree top should balance the root system. Many tree planters find it best to remove all the side branches of the deciduous tree, leaving only the leader or main shoot. This leader should not be pruned back in the deciduous variety. There is no need of pruning the top of evergreens at the planting time, and except in the case of some varieties of cedar it is undesirable.

#### PROTECTION TO THE YOUNG TREE

The work is not over when the tree is in the ground and the soil packed about it. Where there is likely to be strong wind the tree should have the support of a strong stake reaching up into the lower branches. Guards should be around some trees, particularly along the street or in fields where cattle can injure them. For the first two years the base soil will need cultivation. As the trees grow they will need pruning—a question of individual judgment governed by the shape of the tree.

The beauty of a shade tree depends upon its normal and symmetrical growth.

## The Nation's Pride

Beautifully shaded homes, parks, highways, and avenues are assets to an individual city, State, or Nation. Once a year, at least, this fact is brought to our attention, on Arbor Day.



Better than any "Welcome" or "Call Again" sign

### HISTORY

The first Arbor Day occurred as early as April 10, 1872. The "Father of Arbor Day" was J. Sterling Morton, who, at a meeting of the State board of agriculture in Lincoln, Nebr., introduced a resolution setting aside April 10 of each year for tree planting. This date was later changed by the State legislature to April 22 to honor Mr. Morton, this latter date being his birthday.

Three years later Kansas and Tennessee took up the practice. Seven years later North Dakota and Ohio followed. Now Arbor Day is observed throughout the country. These pioneer States can proudly point to the small beginning and take the lion's share of the credit for the nation-wide spread of the practice.

### TREE-LINED HIGHWAYS

A great deal of attention is given this subject by State officials to govern the extent of the planting, to prevent the obscuring of intersections, to give beauty by natural groupings of trees instead of monotony by even spacing, and otherwise to direct this important work, with the result that at the present time there are 45 recognized highways on which projects for roadside tree planting are under way or are contemplated.

With the rapid increase in motor travel and the extension of motor highways throughout the United States, the problems of roadside tree planting and conservation have automatically annexed themselves.

### TREES SPEAK LOUDER THAN WORDS

This is almost synonymous with "Say it with flowers." No "Welcome" or "Call again" signs are necessary when the traveler is greeted by good roads and shade trees. He doesn't have to be urged to call again; he is glad to come again because of the first delightful reception he received by your "mute sentinels"—the shade trees.

### NEEDS OF THE PROJECTS

There are many project homes without shade trees of any kind. This is not only uneconomical but actually harmful. You are deprived of their protection from the wilting rays of the sun in the summer and the cold blasts of wind in the winter. You do not enjoy the enhancement in value of your property that shade trees effect, to say nothing of the improvement in appearance of the farm home. They also retard evaporation.

### ÆSTHETIC VALUE

Beauty in every form has an influence for good. Forms of beauty differ greatly in their effect on persons. Children especially are wonderfully affected for good or ill by their surroundings. The greatest influences are probably seldom realized at the time they are exerted.

## Try These

In the "Wanted" column of the August issue of the Era I called for "a good, tried recipe for preserved watermelon rind."

Here is one that has been used for 30 years, also a good recipe for peach pickles, both contributed by Mrs. E. M. Douglas, of Washington, D. C. (Mr. Douglas certifies the results are good.)

### WATERMELON PICKLE

Pare off very carefully the green part of the rind of a good, ripe watermelon, trim off the red core, cut in pieces 1 or 2 inches in length, place in a porcelain-lined kettle in the proportion of 1 gallon rinds to two heaping teaspoons common salt and water to nearly cover; boil until tender enough to pierce with a silver fork, pour into a colander to drain, and dry by taking a few pieces at a time in the hand and pressing gently with a crash towel. Make sirup and treat rinds exactly as directed for pickled peaches. Continue adding rinds as melons are used at table, preparing them first by cooking in salt water as above. When as many are prepared as are wanted and they are nearly pickled, drain and finish as directed in peach pickles, except when the sirup is boiled the last time put in melons and heat through; set jar near stove, skim out melons, and put in jar a few at a time, heating gradually so as not to break it; then pour in sirup boiling hot. A rind nearly an inch thick, crisp, and tender is best, although any may be used. If seum rises and the sirup assumes a whitish appearance, drain, boil, and skim sirup, add melons, and boil until sirup is like thin molasses. Don't cook too soft; leave the pieces very firm. Don't cut off red and green too deep; the color will cook out. Be sure the sirup is thick.

### PEACH PICKLES

Pare freestone peaches, place in a stone jar, and pour over them boiling hot sirup made in the proportion of 1 quart best elder vinegar to 3 pints sugar; boil and skim and pour over the fruit boiling hot, repeating each day until the fruit is the same color to the center and the sirup like thin molasses. A few days before they are finished place the fruit, after draining, in the jar to the depth of 3 or 4 inches, then sprinkle over bits of cinnamon bark and a few cloves, add another layer of fruit, then spice, and so on until the jar is full; scald the sirup each morning for three or four days after putting in the spice, and pour sirup boiling hot over fruit, and, if it is not sufficiently cooked, scald fruit with the sirup the last time. The proportion of spices to a gallon of fruit is two teaspoons whole cloves, four tablespoons cinnamon.

Another answer to the call was received from Mrs. Emery Bright, Nestle-down Farm (North Platte project), Lingle, Wyo.

### PRESERVED WATERMELON RIND OR CITRON

Pare off the green skin, cut rind into pieces, weigh and allow to each pound a pound and a half of sugar. Place rind in preserving kettle without sugar and cover with water; scatter a few bits of alum among it and place a thick cloth over kettle. Simmer fruit for two hours. Drain all the water off. Melt sugar, using a pint of water to pound and a half of sugar. Mix with it some beaten white of egg, boil, and skim the sugar. When clear, put in rind and let boil for two hours. Take out rind and boil sirup longer, pour over rind,

and let stand overnight. The next morning boil sirup with lemon juice; slice lemon in thin slices and allow one lemon to a quart of sirup (or less according to taste). When thick enough to hang in a drop from the point of a spoon it is done. Pour over rind which has been placed in jars. Let stand three or four weeks before using.

There are times, as at present, when it seems to us that fortune smiles throughout our land, and that the horn of plenty stands tilted, ready to spill its contents over our part of the project even to the utmost limits of lateral D-56. But again there are days when it seems that we must yield to the assault of the hard siege of adverse conditions, and it was on such a day that the following lines, which we offer here with apologies to Edgar A. Guest, were written.

### A HEAP O' LIFTIN'

It takes a heap o' liftin' in a Wyoming homestead shack,  
A heap o' coal an' water and you're like to break your back  
Before you really know it, or come to understand,  
By trudgin' of 'em daily, with 'em always in your hand.  
You've got to maneuver an' scheme, an' for years you've got to plan,  
An' learn to make a dollar go further than a dollar really can.  
An' you must work both night and day; you've got to never stop.  
You've got to lift each water pail an' count its every drop.  
You've got to feel the weight of coal, be it anthracite or slack—  
It takes a heap o' liftin' in a Wyoming homestead shack.—L. B. H., Shoshone project, Wyoming.

## Harvesting Time Means Canning Time for the Housewife

**C**HOOSING fresh fruits and vegetables for canning, proper processing, and air-tight sealing are the three steps toward success in home canning.

Successful canning is based on an understanding of the causes for the rapid spoilage of fresh foods and on a knowledge of the methods by which this spoilage may be prevented. One of the causes of spoilage is the presence of substances called "enzymes" in all fresh fruits and vegetables. These enzymes bring about the normal ripening of the products, and unless checked they bring on final decay. The heat of cooking and canning checks their action, so it is only necessary to prevent the changes they may bring about between the time the material is gathered and the time it is cooked or canned. This is the reason for the emphasis upon canning fruits and vegetables as soon as possible after the have been gathered.

The second and more important cause of food spoilage is the action of minute organisms which are present in the air, soil, water, and, in fact, on everything—yeasts, molds, and bacteria. Yeasts and molds are easier to kill than bacteria and do not cause so much difficulty in canning. Many kinds of bacteria are able, when unfavorable conditions arise, to go over into a so-called spore form, in which they are very difficult to kill. For this reason bacteria are the chief factors to be considered in canning. If all bacteria are

killed and the product is sealed steaming hot within a sterile air-tight container, the food is said to be sterilized. The application of heat to foods during canning in order to kill bacteria is called processing.

The presence of air has always been associated with food spoilage, owing to the fact that these small plants are present in the air even though they can not be seen with the naked eye. When unheated air comes in contact with food it spoils, not because of the air but because of the bacteria, yeasts, and molds it contains.

### HOT PACK—IMPROVEMENT ON OLDER METHODS

The hot pack in home canning is just what the name implies. It is a method of packing fruits and vegetables in the containers ready for processing in boiling water or under steam pressure; it is not a complete method of canning. The hot pack helps to cut down the chances of spoilage, but it is the processing which follows that destroys the most troublesome bacteria. The hot pack is recommended for some fruits and all vegetables.

The hot pack is in no sense a revival of the old-fashioned open-kettle canning. By that method the food was cooked until tender and supposedly free of bacteria in an open vessel, then filled into sterilized jars, sealed air-tight, and stored. Unfortunately, into the jars with the food went bacteria from the air, from ladles used in filling, and sometimes from the hands or cloths that accidentally got in the way. Sometimes these bacteria were sufficient to cause spoilage, sometimes not. It was chiefly a matter of luck.

The hot pack followed by processing in water-bath or steam-pressure canner is an essentially different and much surer method. The food is packed hot; then it is processed in sealed containers. This heat of processing kills the bacteria that were in the food when it was packed, and the air-tight seal prevents any more bacteria from entering.

Taking proper precautions in the preparation of food, which costs labor or money or both, means the practice of thrift and the safeguarding of the family's health.

It is wasteful to allow food to lose its attractive flavor or appearance; moreover spoiled or infected food may be actually dangerous to health or even to life.

Preserving is often the solution.



An October scene on one of the projects



## The Utah Poultry Producers' Cooperative Association

*An organization started in 1923 which now comprises 1,600 members—The turnover on eggs alone this year will amount to more than \$2,000,000—A fine example of cooperative effort, standardization, and efficient management*

*By W. L. Whittemore, superintendent, Strawberry Valley project*

**T**HE Utah Poultry Producers' Cooperative Association is the outgrowth of a determined effort on the part of the poultry producers of the State to secure better prices for their products through standardization and cooperation.

Prior to 1922, the State of Utah was an importer of poultry products. Large shipments of dried albumen for use of candy factories and bakeries were also imported from China. In 1922 seven carloads of eggs were exported from the State.

### ORGANIZED IN 1923

At the time the association was started in 1923, producers were receiving in the neighborhood of 12 to 15 cents per dozen for eggs, while in New York eggs were selling at 75 cents or more per dozen. This discrepancy in price showed the economic necessity for bringing the producers and consumers more closely together through some form of cooperative marketing association. With the passage of the cooperative marketing bill, which permitted poultry growers to organize, the Utah Poultry Producers' Cooperative Association was formed under the leadership of Mr. Benjamin Brown. The organization as at first formed embraced only the counties of Sevier, Sanpete, and Juab. It has continued to grow until at the present time it embraces the entire State, operating six grading plants at Richfield, Provo, American Fork, Draper, Salt Lake City, and Ogden.

The shipments during the first year were 84 carloads; during 1925, 355 carloads of graded eggs were shipped, and it is anticipated that during the present year the total shipments will be in excess of 500 carloads, representing a turnover in excess of \$2,000,000.

The association is duly incorporated with 300,000 shares of stock, par value \$1 per share. Each producer purchases stock at the rate of 1 cent per dozen for all eggs marketed through the association. As the producers could not afford to wait an indefinite period for their money the association adopted the plan of paying the producers the price per dozen at the nearest consuming markets such as San Francisco or Los Angeles now supplied by local agencies. The difference between this basic price and the final selling price of the eggs in New York market or other eastern markets was in consequence a

profit to the producer and accordingly prorated at the end of the year, with the exception of the 1 cent per dozen for purchase of stock and other deductions for overhead expenses of the association in marketing the eggs. The producers each year have voted to apply this difference to purchase of stock for creating a good working capital.

### MARKETING EGGS

Egg shipments are received at the plant and graded before payment is made, the producer receiving the standard price for each of the several grades into which his shipment of eggs has fallen. Eggs are graded into five classes. No. 1 are extra selected eggs, white, uniform in size and color, shell texture, and content, weight 22 ounces or more per dozen. No. 2, selected eggs, slightly soiled, slightly variable in shape, slightly creamy in color, weight 22 ounces or more per dozen. No. 3, standard eggs, may be slightly soiled, imperfect shell, any color, good quality, weight 22 ounces or more per dozen. No. 4, Mountaineer, includes all underweight rejected eggs from grades 1 and 2, weight 18 ounces or over per dozen. No. 5, pullets, includes underweight rejected eggs of standard grade.

All checked eggs are sold locally at the prevailing market price or are broken and the whites separated from the yolks. These segregated parts are each canned and frozen. This product finds ready sale to candy factories and bakeries and is gradually replacing the previously imported powdered albumen from China.

Eggs containing blood specks, broken yolks, and which are otherwise unfit for human consumption are sold back to the producers for baby-chick feed or to fox farms.

The only eggs placed in cold storage by the association are those put away for

regular trade. These are carefully graded before storage and are usually processed by being first dipped in hot paraffin oil heated to sterilized heat of 190° F. and then immediately run into cold oil, which seals every pore. These eggs, upon removal from storage, are again regraded before shipment.

### POULTRY AND BABY CHICKS

In addition to grading and shipping of eggs, the association also engages in the marketing of live and dressed poultry. During 1926, 14 carloads of live poultry have been shipped out. These are usually the roosters received in purchasing young chicks and are from 9 to 12 weeks old, weighing 1¼ to 1¾ pounds apiece, and bring prices ranging from 18 to 20 cents a pound. Seventy thousand birds have also been dressed and put in cold storage for future sale.

During 1925 more than 260,000 baby chicks were imported by the association for its members. The association now has under advisement the establishment of its own hatcheries from which baby chicks will be sold at cost to producers.

The association also ships in and mixes for its members chicken feed, the cost of which is prorated to the producer at considerable saving.

The association also handles live and dressed turkeys and last year secured 40 cents a pound for all turkeys marketed through it.

### MEMBERSHIP

The association at present comprises 1,600 members throughout the State, with main offices at Salt Lake City and managers at each of the six association points; also, a director of sales in New York City. The association has been fortunate in securing the unqualified support of local banks in all their undertakings. This has been primarily through the confidence placed in the excellent personnel of the association's directors.

These are some of the accomplishments of the Utah Poultry Producers' Cooperative Association. It is a fine example of what can be done through cooperative effort, standardization, and efficient management. The writer is indebted to Mr. N. S. Lofgreen, manager of the Provo plant of the association, for most of the information contained in this article.

## Age Limits Announced For Civil Service Jobs

The Civil Service Commission announces that in the future the maximum age limit for clerical positions, such as clerk, stenographer and typist, typist, bookkeeper, etc., will be 50 years. The present minimum age limit of 18 years will be continued.



## Onion Seed Growing on the Uncompahgre Project, Colorado

*A remunerative crop for the experienced grower who knows his onions—The necessary steps to be taken in planting, irrigation, cultivation, and harvesting told in a convincing manner*

*By A. L. Franklin, Uncompahgre project*



Mountain Red Globe onion seed, grown by A. L. Franklin on the Uncompahgre project, Colorado

ONE of the largest growers of onion seed in the United States has described Mountain Danvers onion as follows: A medium large apple-shaped amber yellow variety of more than usual merit. Mountain Danvers itself is not a new onion, but this strain is and it really deserves a new name.

Our stock was grown with all the painstaking care that one gives to the most exclusive stock seed. Among a list of some 250 lots of onion samples growing for inspection at our trial grounds at Laurellone, near San Carlos, the most conspicuous, the best keeper, the most uniform was this sample of Mountain Danvers.

The color is peculiarly attractive, being a clear amber or a yellow with a tint of brown. The uniformity of the strain is easily distinguishable, since the size, shape, and color are unusually uniform for a yellow onion. The variety has impressed us as one particularly adapted for market purposes.

### HISTORY

When I came to the Uncompahgre Valley in the spring of 1912 I found several small patches of onion seed which was grown for local use only. In the winter of 1913-14 my brother, W. L. Franklin, and I sold Henry Field Seed Co. 200

pounds. This firm was the first to catalogue this seed, and gave it the name "Mountain Danvers."

When we began growing this onion the bulbs were rather flat, but by selecting the best globe shape we could find each year it is now described and sold by most seedsmen as a globe or apple shape.

The Mountain Red Globe was developed by the writer by taking a good strain of South Port Red Globe, and by selecting each year only the finest bulbs for stock seed it is now almost as early as Mountain Danvers, maturing perfectly in our high altitudes. Henry Field Seed Co. were the first to introduce this seed. They also gave it the name.

Each year we select a few sacks of bulbs of each of these two varieties of good size, shape, and color for stock seed to improve the stocks and develop new strains.

### DEMAND

The demand for our seed has often been greater than the supply. The writer and his brother are now supplying 15 seed firms. Much of this is shipped to the East, going as far as Boston. Many short-season localities are now growing large crops of fine quality onions from this seed. Only a few years ago Idaho had only a few acres of onions.

This year, according to Government reports, the State has 1,800 acres grown almost exclusively from Mountain Danvers and Mountain Red Globe seed.

Our 1926 crops have yielded well, with seed of fine quality. The writer has 3 acres expected to make 1,500 pounds per acre. Franklin Bros. will have 25,000 pounds for shipment in the winter of 1926-27.

### PLANTING

Bulbs for seed growing should be planted as early in the spring as soil can be worked, as an early start is a most contributing factor in getting a maximum yield. We began planting for the 1926 crop on February 8 and completed the job on the 27th.

In planting furrows are made about 5 inches deep and 30 inches apart. Bulbs are distributed as evenly as possible into the furrows from sacks, then each bulb is placed upright so they almost touch each other in the row. About 15,000 pounds of bulbs are planted to each acre. Bulbs should be sound, medium large, and unsprouted. Very small or very large bulbs make few seed. Bulbs are covered with a two-horse cultivator. After planting is completed the ridges left by the cultivator in covering should be harrowed almost level.

## IRRIGATION

Intelligent use of water for irrigation is an important factor in growing onion seed successfully. Land should be of even grade and care taken to have the field wet uniformly. All head ditch banks should have blue-grass sod and by means of small boxes water may be controlled at all times and each row may have only enough flow to reach the end without washing or waste of water.

We have found if too much water is used when plants are in early stages of growth, weak spindling seed stalks may result which are easily blown or broken by wind. In advanced stages of growth overirrigation may cause blight.

We irrigate onion seed two or three times from planting to last cultivation. When plants are ready to bloom the soil must be wet thoroughly every 6 or 7 days until about 10 days before harvest, when irrigation is dispensed with.

## CULTIVATION

Cultivation should follow each irrigation so long as a cultivator can be used without bruising or breaking the seed stalks. The plants even in the early stages of growth have many fibrous roots, which increase in number as plants get larger. These roots should not be disturbed in cultivation, hence shallow cultivation and not too near the plants. A 14-tooth harrow or 5-tooth cultivator are the best implements to use. After plants are in head a cultivator should not be used, as seed stalks are tender and are easily bruised or broken. When furrows for irrigation are made after the last cultivation, some soil should be thrown to plants leaving the row somewhat ridged. This will help to keep the plants upright.

## HARVEST

It is difficult for an inexperienced grower to determine just when onion seed should be harvested. If allowed to become overripe the seed may fall out upon the ground, while if cut too green the seed may be almost impossible to cure.

About three weeks from blooming the crop should be watched closely and where a few pods are found opening and exposing the seed the crop is ready for harvest.

We use wire baskets commonly used in spud and onion harvest. These are lined with cloth or burlap. The basket is carried in front attached to a belt around the waist. The heads are cut with a knife and placed in the basket. When a basket is filled the contents are dumped into a burlap sack. To facilitate drying we dump only one basket-full to a sack. The sacks are placed on

# The Federal Capital of Australia

## An Example of Successful Rural Planning

**W**ITHIN a few months the Parliament of the Commonwealth of Australia will meet at Canberra, the new Federal capital, the Duke of York going out from England to participate in the opening ceremonies. This Federal capital has an interest to the people of the United States because Australia followed in the footsteps of this country in the selection of a capital site in the creation of a capital district and adopting comprehensive plans for future development.

The Federal capital is in the State of New South Wales. For this the Government acquired a district of 940 square miles. It controls the headwaters of the stream that furnishes the city water supply and enables the river to be included as an essential part of the provision for parks and recreation.

Competitive designs for the city were invited and the first prize was won by Walter H. Griffin, of Chicago, Ill., who was employed for a number of years in supervising development under his plan. It had been the purpose to have an international competition for the designs of the Parliament buildings, but this was interrupted by the great war, and the first Parliament will be held in a capitol planned by local architects to meet present rather than future needs.

The great cost of land and city improvements caused considerable anxiety for fear the expenditure would be a burden on the nation's taxpayers, but now that the streets have been laid out, waterworks completed, Parliament buildings erected, and the date for Parliament to assemble fixed, rendering it certain that there will be a capital city, these misgivings are ended.

Now that the city is ready for settlement, the Government is selling leases for 99 years, on lots wanted for business or residences.

The second sale of leases aroused widespread interest. Buyers were present from Sydney and Melbourne, and other parts of New South Wales. There was

spirited bidding, particularly for the 18 retail trading sites in the civic center at Ainslie. Prices showed a considerable advance as compared with those obtained at the auction in 1924, and the upset prices of the leases were largely exceeded. Bank and insurance companies secured sites in the retail trading center, and the values for sites purchased in this sale were 150 per cent higher than the banks paid 18 months ago. The Commonwealth Bank gave £5,600 for a corner block, and on the next corner the Bank of New South Wales secured a block for £5,200. At the 1924 sale the highest price was paid by the Commercial Banking Co. of Sydney (Ltd.), who bid £2,050 for a corner block, and another block was secured by the Bank of Australasia for £1,550. Among the purchasers at the civic center on May 29 were the Commercial Bank of Australia (Ltd.), who paid £2,700; the Australian Provincial Assurance Co., two adjoining blocks at £2,300 and £2,600, respectively; and the Royal Insurance Co. (Ltd.) for a block. In the residential areas of South Ainslie, Blandfordia, Telopea Park, and other subdivisions, 21 residential blocks were sold for an aggregate of £7,480. The total sales amounted to £46,580, and this will produce an annual rent of £2,329. Bidders pay 5 per cent of the amount bid and 5 per cent on the unimproved value of the land after each 10-year reappraisal.

In the residential areas the conditions provide that the minimum cost of buildings to be erected shall be \$5,000 in South Ainslie, \$6,000 in Telopea Park, and \$7,500 in Blandfordia. Recently the lease of a quarter of an acre was secured at auction for a picture show for \$35,000. This land was purchased by the Commonwealth for \$15 an acre.

The Government official in charge says the indications are now that the entire expenditure of the Government will be repaid in 25 years.

seed stalks for curing which, if the weather is dry and hot, will be completed in about two weeks. The seed must be dry before storing or it will heat and spoil. To hasten drying the sacks should be shaken and turned every three or four days. If there should be rain the sacks must be shifted as soon as the ground has dried. After the seed is threshed it is cleaned as well as possible with a fanning mill. As onion seed is light in

weight low speed must be used when using a cleaner. Water must be used to complete the cleaning. After water cleaning the seed is dried on wire-cloth trays placed in a sunny place.

## CONCLUSION

Some seedsmen have expressed the opinion recently that the Uncompahgre Valley should take up seed growing in a large way.

## The Rabbit Industry on the Newlands Project, Nevada

*A growing industry which is bringing pleasure and profit to a number of water users—New Zealand Red is the favorite breed, with some Flemish Giants and Belgian hares*

*By H. M. Knobloch, purchasing agent, Newlands project*

**T**HE rabbit industry has in the past few years become a lucrative source of revenue to many farmers on the Newlands project. There are quite a number of breeders with from 500 to 3,500 animals, among the largest being C. M. Powell, of Swingle Bench. Mr. Powell has on hand approximately 3,500 animals, including breeding stock and those that are practically ready for the market.

The New Zealand Red is the favorite breed for eating and is shipped principally to Sacramento, San Francisco, and other market points in California. Rabbits are ready for the market when from 3½ to 4 months of age and weigh from 3 to 3½ pounds at this age. There are some Flemish Giants and Belgian hares raised, but the commission men, to whom the majority of the rabbit raisers ship, prefer the New Zealand Red, which although smaller than the other two breeds have a finer grade of meat.

killed for the market, although some breeders keep their does until they are 3 years old. Old does do not bring the same price on the market as young rabbits, usually being about 5 cents per pound cheaper. Young bucks are first used for breeding when they are 6 months old and are usually kept until about 1 year old, although some breeders keep their bucks for a considerably longer period. These are also killed and shipped to the market, the price being about the same as for old does, unless they are too badly scarred from fighting, in which case they are killed and thrown away. It is the general practice to keep 1 buck to every 8 does in pens about 6 by 8 feet, although some breeders put 5 bucks with 40 does in pens 10 by 10 feet. When this latter method is used, there is some loss on account of bucks fighting, but the breeders who use this method claim that the loss on this account is less in dollars and cents on

### PREPARATION FOR MARKET

Young rabbits when fed grain will grow faster and attain a weight of 3 to 4 pounds more quickly than those fed alfalfa exclusively. However, the majority of breeders have found that it is cheaper to keep the young rabbits a month longer on alfalfa ration rather than grain on account of the high price of the latter. The quality of the meat is just as delectable when fed alfalfa as when fed grain.

In preparing the rabbits for market raisers usually kill and clean the rabbits in the late afternoon. They are then placed in sacks and taken to the local ice plant, where they are placed in storage and shipped out the next day by express, reaching their destination in fine shape. They are hog dressed, being shipped with their skins on.

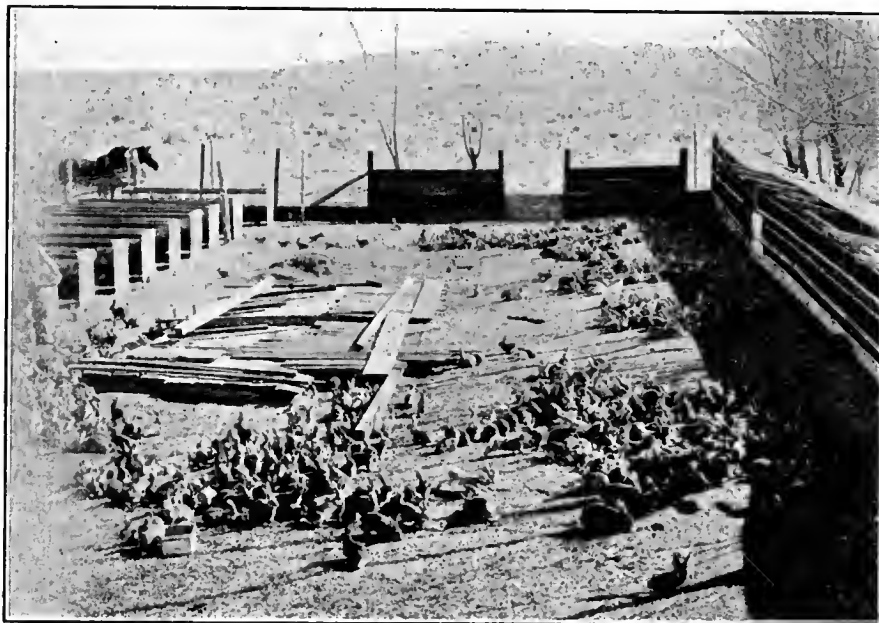
Although the price of rabbits varies during the different seasons of the year, an average price of 27 cents per pound dressed is considered a fair average. Some breeders have received as high as 42 cents per pound in the fall; on the other hand, the price in the summer has been known to drop as low as 17 cents.

### COST OF RAISING

It has been found impossible to secure from the farmers themselves the exact cost of raising rabbits for the market; however, the Department of Agriculture some time ago conducted an experiment to try and arrive at the cost of producing young rabbits for the market. Thirty young rabbits with an initial weight of about 1 pound each at 1 month of age were placed in a separate pen. At the beginning of the experiment these young rabbits consumed hay at the rate of 15.8 per cent of their weight each day. They produced 1 pound of gain for 7½ pounds of hay and made an average gain daily of 1.9 per cent. These rabbits were fed good third-crop alfalfa hay only. With hay at \$10 per ton they produced meat at 4½ cents per pound live weight, which is by far the cheapest production secured on any meat animal.

Young rabbits when being raised for market are placed in pens approximately 10 by 10 feet with wooden top and floor and with all sides covered with wire netting. In these pens are placed from 125

(Continued on page 181)



Young rabbits being fattened for market

Does are usually bred when 6 months of age and will kindle from 4 to 9 young, the average young raised being about 7. Some does kindle as high as 11 and 12, but these are exceptional cases. The young are weaned when 1 month old, and mature does will average five litters per year during their lifetime. The does are usually kept until they are about 2½ years of age, when they are then

account of the time and space saved. Other breeders keep their bucks in separate pens and the does in pens about 10 feet square. Each week the does are examined and when they become heavy, usually about a week or 10 days before the young are born, they are placed in separate hutches until the young are weaned, when they are placed back in the breeding pens.

## New Clubhouse of the Naches Heights Community Club

**T**HE Naches Heights Community Club, made up of the residents of Naches Heights, one of the most beautiful sections of the Tieton division of the Yakima project, Washington, has just completed an attractive and commodious clubhouse, a view of which is shown in the accompanying illustration.

The club is incorporated under the laws of the State of Washington, with 125 stockholders, all landowners of Naches Heights, with the following officers: President, C. E. Udell; vice president, Lloyd Garretson; secretary-treasurer, Arthur J. Weeber; trustees, William McKinney, C. C. Bemis, Russell Bush.

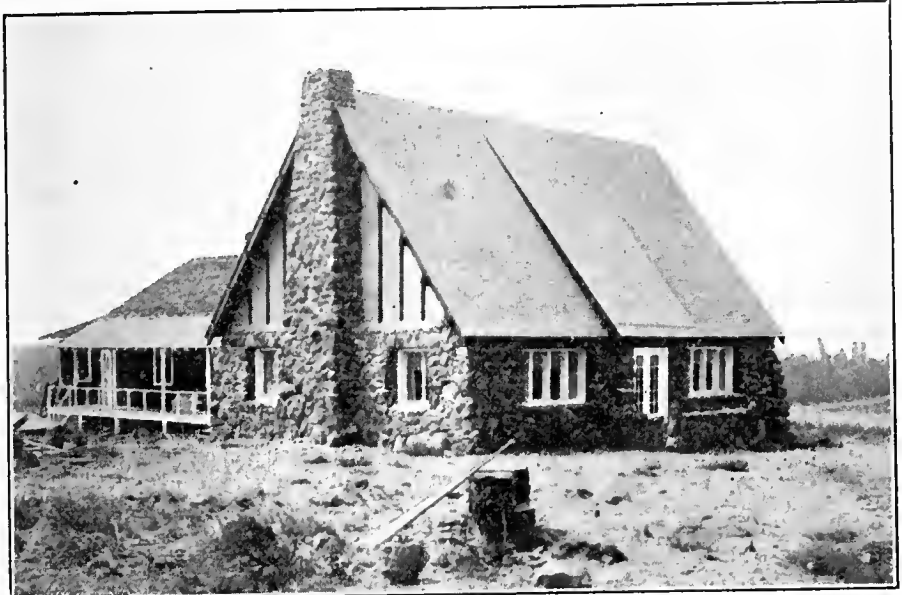
The completion of this clubhouse is the result of the united effort and work of the entire club, with the principal features of the undertaking being handled by the following committees:

Building committee: Lloyd Garretson, Russell Bush, Mrs. C. Gay Wever.

Soliciting committee: Arthur J. Weeber, John Rued, John B. Weeber, C. C. Bemis, William McKinney, C. E. Crownover.

Site committee: Walter Hansen, Mrs. A. M. Ernsdorff, Dan Williams.

The clubhouse is ideally located on what is locally known as the Naches Ridge Road, the county highway from Yakima to Tieton City, one of the most scenic and best maintained gravel-surfaced roads in the county.



Naches Heights Community Club House, Yakima project, Washington

The building is T-shaped, with the main part 30 by 45 feet, built of native lava rock, forming the assembly room, and a 25 by 45 foot annex, made up of the old community building, forming the dining room and kitchen. There are folding doors between the dining room and main assembly room, which make it

possible to throw both rooms into one, forming a large meeting room. It is modern in every respect, with hardwood floors, electric lights, water piped in from a concrete cistern on the premises, and hot-air heat.

The club started out to build a clubhouse that would cost about \$10,000, including the old building, and \$8,262.99 has been spent to date on the new structure, the greater part of which has been paid into the club in stock subscriptions.

The clubhouse is a monument to the cooperative and progressive spirit and ideals of the community, and the membership of the club is to be congratulated on its accomplishment. While the entire club labored diligently to secure this community improvement, special credit is due Mr. Lloyd Garretson, a member of the board of trustees of the Tieton Water Users' Association, who resides on and operates one of the largest fruit ranches on Naches Ridge, and as chairman of the building committee spent a great deal of time in supervising details while the building was being constructed.

The final dedication of the building was celebrated on the evening of August 4, the large crowd present being made up of water users from all parts of the Tieton division and a great many business men and their families from the city of Yakima.

Above their cash income from the farm, farmers have other income in the form of food products which they set aside for consumption by their families, use of houses for their shelter, and some fuel for use in their homes.

## Rabbit Industry on Newlands Project

(Continued from page 180)

to 210 animals according to size. An ample supply of fresh, cool water and alfalfa hay is supplied each pen throughout the growing period.

There is practically no disease among domestic rabbits on the Newlands project when they are carefully handled, owing, it is thought, to the extremely dry climate. Very few animals are lost through diseases sometimes prevalent among wild rabbits.

Practically all of the breeders sell through commission men, and it is estimated that the shrinkage, commission for selling, and express charges amount to approximately 3 cents per pound.

### RAISING FOR FUR

Mrs. C. I. Teel is the most extensive breeder of the fur-bearing rabbits. In addition to a fine breed of New Zealand Reds which she raises for the market as

well as for sale as breeding stock, she raises the Chinchilla and American Blue. The Chinchilla is about the same size as the New Zealand Red and their hides bring from \$1.50 up, according to its condition. Their fur is prime when they reach the age of 5 months and each three months thereafter. The American Blue is about the size of the Flemish Giant and the price of its hide at the present time is a little lower than the Chinchilla. In raising these latter two breeds it is not only possible to sell their hides but the meat as well. The chief drawback in the raising of these animals is the original cost. Does when 6 months old sell for \$10 to \$25 each, according to their size, condition of their fur, etc. The price of bucks is about the same. The fur-bearing animals are raised as easily as any other breed and appear to be as hardy and free from disease.



## Organization Activities and Project Visitors

**R.** F. WALTER, chief engineer, visited the Guernsey and Jackson Lake Dams and the Riverton project during August.

S. O. Harper, general superintendent of construction, visited recently McKay Dam, Ontario, Boise, American Falls Dam, King Hill, Vale, Owyhee, and Umatilla projects.

George C. Kreutzer, Director of Reclamation Economics, was in the Denver office the first half of August, leaving on the 14th for a trip covering the Alcova-Casper pumping units, the Saratoga-Encampment project, and other investigations throughout the Northwest.

C. C. Elder, assistant engineer, continued hydrographic work on the Rio Grande and tributaries between Embudo and San Marcial, making stream-flow gaugings, collecting silt samples, installing and reading drainage wells, setting soil evaporation tanks, and installing meteorological equipment obtained from the United States Weather Bureau.

Andrew Weiss, Assistant Director of Reclamation Economics, has resigned, effective September 30, to be associated with the J. G. White Engineering Corporation in Mexico.

Homer J. Gault has been designated construction engineer of the Stony Gorge Dam, Orland project, and Ralph Lowry construction engineer of the Gibson Dam, Sun River project.

W. L. Drager, assistant engineer in the Denver office, has submitted his resignation to accept a position with the J. G. White Co. on construction work in Mexico.

Kenneth B. Keener, assistant engineer, has been transferred from the Boise to the Denver office.

A committee has been appointed to study operation and maintenance methods and results on various irrigation projects throughout the West. The personnel of the committee comprises Porter J. Preston, representing the Bureau of Reclamation; L. N. Holt, representing the Bureau of Indian Affairs; and Ray Carberry, representing private interests. The investigation will probably cover five reclamation projects, five large private projects, and two Indian projects.

Miss Cora B. Brownell, clerk on the Yuma project, has resigned, and the vacancy has been filled by the transfer of Miss Elisabeth von Hagen from the Grand Valley project.

W. C. Matthews, special assistant to the Attorney General in direct charge of the Orland water-right adjudication suit, spent 10 days on the project familiarizing himself with the Stony Creek watershed.

The following representatives of contracting firms inspected the Stony Gorge Dam site on the Orland project recently: H. Stanley Bent, vice president, L. T. Grider, general superintendent, and M. H. Slocum, superintendent at Exchequer Dam, all of Bent Bros. (Inc.); Guy F. Atkinson, general contractor, of Portland, Oreg.; Oro McDermith, president Derbon Construction Co.; William Smaill, chief engineer Northern Construction Co., Stewart & Welch (Inc.); Nat McDougill, vice president and secretary, and V. C. Wrenn, of A. Guthrie & Co. (Inc.); J. Q. Barlow, Utah Construction Co., San Francisco, Calif.; Willard T. Cannon, Lynch-Cannon Engineering Co.; D. B. Fegles, president, and Charles R. Conkey, vice president and general manager, Fegles Construction Co.; W. B. Clapp and J. B. Bruce, S. W. Stewart and E. H. Burroughs, president and vice president, respectively, of the Ambursen Dam Co.; W. L. Carey, president, J. B. Bertrand, and C. W. Hotaling, of the Allied Contractors (Inc.), accompanied by Engineer U. S. Marshall of the Southern Surety Co.; J. C. Gist, engineer for the Ross Construction Co.

Miss Annie E. Higgins has been transferred from the Shoshone project to the Grand Valley project to fill the vacancy caused by the transfer of Miss von Hagen to Yuma.

Professor Potter, of the animal husbandry department of the agricultural college of the State of Oregon, spent a day on the Uncompahgre project studying agricultural and livestock conditions.

Marcelo Leon, an engineer with the Mexican Government, was a recent visitor to the Boise project.

A party of home seekers from Iowa, Wisconsin, Minnesota, and South Dakota, sponsored by the Northern Pacific Railway Co. and accompanied by business men, officers of the Great Western Sugar Co., railroad officials, and the



A Belle Fourche project wheat field





A field of Yuma project cotton

county agent, visited the Huntley project recently. Luneheon was served to about 75 at the demonstration farm at Osborn. The visitors were very enthusiastic over the opportunities on the project and the general crop conditions.

Among the recent visitors to the Milk River project were Senators Walsh and Wheeler, of Montana; and S. G. Dawson, engineer, Dominion Water Power and Reclamation Service, who visited the St. Mary storage division; W. S. Wing, managing editor of Farm and Fireside, and Ralph Budd, president, L. C. Gilman, vice president, and E. C. Leedy, general agricultural development agent, of the Great Northern Railway.

Superintendent Stuver, of the Newlands project, and Roy W. Stoddard, attorney, spent several days in Washington, D. C., in connection with the preparation of a contract for turning over the operation and maintenance of the project to the water users.

Charles R. Wheeler, clerk on the Klamath project, has been transferred to the Denver office.

Officials of the California-Oregon Power Co. conferred recently with Superintendent Newell and Hydrographer Smith of the Klamath project in regard to the regulation of Upper Klamath Lake.

Dr. John A. Widtsoe, who was one of the principal speakers at the meeting of the Montana Irrigation and Drainage Institute, held at Valier, Mont., made a brief inspection of the Greenfields division of the Sun River project while traveling from Valier to Great Falls.

J. M. Hughes, land commissioner, and G. H. Plummer, western land agent of the Northern Pacific Railroad Co., visited the Kittitas office to confer with Walker R. Young, construction engineer, and F. A. Kern, secretary of the Kittitas reclamation district, regarding a plan of settlement of railroad lands near Cle Elum, and contracts for reservoir right of way.

George C. Kreutzer, Director of Reclamation Economics, spent several days on the Kittitas division of the Yakima project in connection with the development of a plan for the settlement of the Badger Pocket and Park Creek areas at the lower end of the division.

Ralph Nelson, foreman on the Shoshone project, has resigned to accept employment in a similar capacity with the contractor who is engaged in constructing the sewer system for Powell.

Senior Clerk August Lewin has been assigned temporarily to the Boise project in connection with repayment accounting.

Maurice G. Ricker, photographer and editor of motion-picture films, returned to the Washington office on August 30 after an extensive trip over a number of the projects during the course of which he took more than 1,000 still pictures and about 15,000 feet of motion pictures.

Miss Margaret A. Compton has been appointed junior clerk on the Rio Grande project and assigned to the position of stenographer to replace Mrs. J. Q. Swain, who has resigned.

Former Governor Thomas E. Campbell, recently chairman of the fact-finding commission, has been overseeing the technical details and historical data concerning the development of the Colorado River and reclamation work in connection with the filming of a new motion picture.



Huntley project corn has taken many prizes at fairs throughout the country

## Colorado River Development Compared with Australian Scheme

A recent issue of the Age, published in Melbourne and a leading newspaper in Australia, contains an interesting comparison of statistics relating to the proposed construction of the Boulder Canyon Dam on the Colorado River and the Hume Reservoir now being developed on the Murray River in Australia. The article is, in part, as follows:

Seven States are interested in the development of the scheme. Denver, in the famous Rocky Mountains, and Los Angeles, the "movies" city, must go to this river for additional water for household and industrial uses. A long tunnel through the Rockies will have to be constructed to supply Denver, and a 300-mile pipe line will be needed to carry the water to Los Angeles, which will be given jet water at 1,500 cubic feet a second. At present the river irrigates 2,000,000 acres of land which was once desert. It can be made to irrigate 6,000,000 acres, or one-ninth the area of Victoria. It now generates electric energy to illuminate a few towns, operate a few mines, and work small industries. It can be made to generate the colossal amount of energy of 6,000,000 electric horsepower. This compares with about 80,000 horsepower under the Yallourn scheme, which has cost about \$45,000,000 to date, and 70,000 horsepower under the Tasmanian hydro-electric scheme, which has involved an

expenditure of approximately \$20,000,000. It is estimated that America will secure social and economic results that will mark the project as one of the greatest constructive achievements of the century.

### Yakima Valley Breaks Fruit Shipment Record

During the week of August 15 to 21 all previous shipping records of the Yakima Valley, Wash., were broken with a grand total of 1,345 carloads of fruit. The former record was approximately 1,200 carloads made some years ago during an apple peak, according to the Yakima Republic.

Peaches led the record with 578 carloads, compared with 237 for last year during the same period. Mixed cars were second with 342. Pears required 242 cars. Other products comprised apricots, grapes, prunes, melons, potatoes, and apples.

The first work will be the construction across the channel of the river of a dam, which from its foundation to its crest will be over 700 feet high, and it will raise the water surface of the river 550 feet. Not only will it be the highest dam in the

world, but will be more than twice as high as any dam ever built in any country. It will cost \$40,000,000. The highest dam in existence now is the Arrowrock, in Idaho, built by the United States Reclamation Bureau, and it stands 349 feet high. The highest in any other country is the Camarasa Dam, in Spain, which is 335 feet high. The dam will create a reservoir to regulate the flow of the river. This reservoir will be 86 miles in length, and hold enough water to cover 26,000,000 acres of land a foot deep, or enough to cover almost half Victoria to that depth, or the American States of New Hampshire, Vermont, Massachusetts, Connecticut, New Jersey, and the District of Columbia. The average flow of the river for a year is 16,000,000 acre-feet; there are 272,000 gallons in an acre-foot. The weir will therefore hold the entire discharge of the river in 18 months. The great floods will be caught and held back until released as required for irrigation purposes. The water will flow over the dam.

It is interesting to compare this section of the scheme with what is being done in Australia. The Hume Reservoir, which is being jointly constructed on the Murray, above Albury, by the New South Wales and Victoria governments, is at present the second largest in the world. It will have a capacity of 2,000,000 acre-feet when completed in about five years' time. Originally it was intended to construct the section to contain 1,100,000 acre-feet, but the extension will now be made without any cessation of work. It will then have a surface area of 41,000 acre-feet, or nearly four times the area of Sydney Harbor, but thirteen times less than the Colorado weir. The length of the dam is 4,200 feet; the height of the dam 120 feet, with a base 92 feet wide and crest width of 32 feet. There is a concrete wall on the up side, supported by an earth embankment on the lower side. This foundation was put in to carry the extension. The cost of the scheme will be about \$17,500,000. The Waranga Basin, one of the principal Victorian sources of water for irrigation, has a capacity of 333,000 acre-feet; while the Yan Yean Reservoir, from which a large section of Melbourne derives its household water, has a capacity of 26,000 acre-feet, so that the Colorado reservoir will be exactly 1,000 times larger. The largest reservoir in the world at present is the Elephant Butte, with 2,500,000 acre-feet, or only slightly larger than the Hume, which is next. Then comes the Assouan Dam, in Egypt, with 1,966,000 acre-feet; the Roosevelt Dam, in America, with 1,300,000 acre-feet, and the Burrinjuck Dam, in New South Wales, with 766,000 acre-feet.



Working to lift that mortgage

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

P. W. Dent, Assistant to the Commissioner

C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

Denver, Colorado. Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak.	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise <sup>1</sup>	Boise, Idaho	R. J. Newell	R. J. Newell	R. J. Newell	Wm. J. Burke	Mitchell, Nebr.
Carlsbad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamele	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont.	A. R. McGinness	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill <sup>2</sup>	King Hill, Idaho	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Klamath	Klamath Falls, Oreg.	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Lower Yellowstone	Savage, Mont.	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	do
Milk River	Malta, Mont.	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Minidoka	Burley, Idaho	D. S. Stuver	G. B. Snow	Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
Newlands	Fallon, Nev.	H. W. Bashore	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
North Platte	Mitchell, Nebr.	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Okanogan	Okanogan, Wash.	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Orland	Orland, Calif.	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Rio Grande	El Paso, Tex.	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Riverton	Riverton, Wyo.	C. C. Cragin	W. F. Sha	Mrs. O. C. Knight	E. E. Roddis	Billings, Mont.
Salt River <sup>3</sup>	Phoenix, Ariz.	L. H. Mitchell	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Shoshone	Powell, Wyo.	W. L. Whittemore	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Strawberry Valley	Provo, Utah	O. O. Sanford	C. M. Voyer	C. M. Voyer	B. E. Stoutemyer	Portland, Oreg.
Sun River	Fairfield, Mont.	H. M. Schilling	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Umatilla	Hermiston, Oreg.	L. J. Foster	R. K. Cunningham	J. C. Gawler	B. E. Stoutemyer	Portland, Oreg.
Uneompahgre	Montrose, Colo.	J. L. Lytel	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.
Yakima	Yakima, Wash.	P. J. Preston				
Yuma	Yuma, Ariz.					

## Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks <sup>1</sup>	H. N. Biekel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo.	F. F. Smith <sup>2</sup>	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Umatilla, McKay Dam.	McKay Dam, Oreg.	R. M. Conner <sup>3</sup>	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash.	Walker R. Young <sup>4</sup>	E. R. Mills		do	do
Sun River, Gibson Dam.	Augusta, Mont.	Ralph Lowry <sup>5</sup>			E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Dam site near Fruto, Calif.	H. J. Gault <sup>6</sup>			R. J. Coffey	Berkeley, Calif.

<sup>1</sup> Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.

<sup>2</sup> Project operated by King Hill irrigation district.

<sup>3</sup> Project operated by Salt River Valley Water Users' Association.

<sup>4</sup> General Superintendent and Chief Engineer.

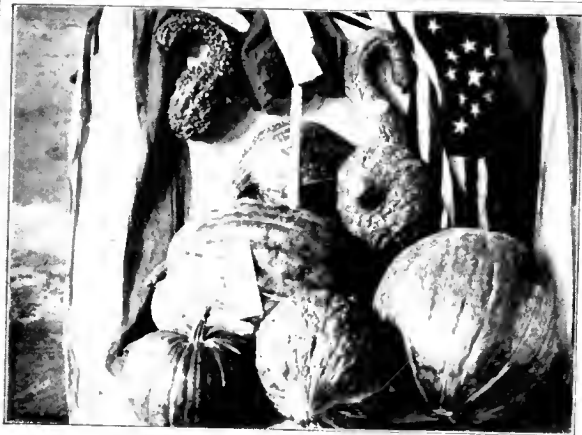
<sup>5</sup> Resident Engineer.

<sup>6</sup> Construction Engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Spanish Springs storage	Fernley, Nev.	A. W. Walker	
Owyhee	Boise, Idaho	R. J. Newell	
Vale	do	do	
Payette division, Boise	do	do	
Gooding	Jerome, Idaho	B. E. Hayden	
Middle Rio Grande	Denver, Colo.	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo.	F. F. Smith	State of Wyoming.
Heart River	Denver, Colo.	G. E. Stratton	
Yakima project extensions	Washington, D. C.	Geo. C. Kreutzer	

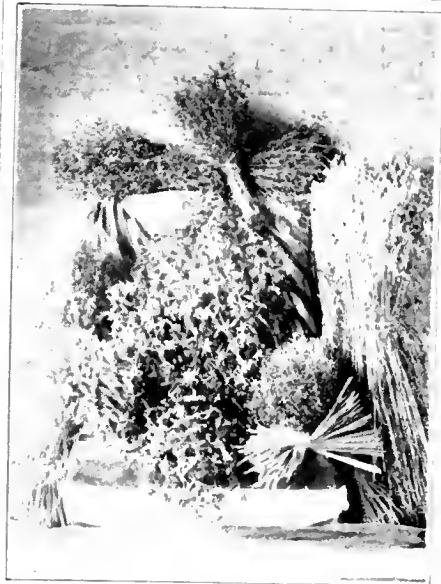
The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



EXHIBITS  
OF



CROPS GROWN ON IRRIGATION PROJECTS



OF THE BUREAU OF RECLAMATION



DEPARTMENT  
OF THE  
INTERIOR





# NEW RECLAMATION ERA

VOL. 17

NOVEMBER, 1926

NO. 11



A FEW OF THE HOLIDAY BIRDS GROWN BY THE THOUSANDS ON THE IRRIGATION PROJECTS



## Thanksgiving

*IN no other nation of the earth is there a holiday—or holy day, as it should properly be written—corresponding to the American Thanksgiving. And in no other nation does there exist the same bountiful reason why this nation should set aside a special day for humble thanks and grateful appreciation for the blessings bestowed upon it and its peoples by Almighty God, the Creator and Giver of all things. Steadily, since the first Thanksgiving Day, more than three hundred years ago when the Pilgrims landed on Plymouth Rock, has the greatness of America, materially and morally, advanced until she stands to-day foremost of all nations in the securement of happiness, peace, and prosperity to her citizenry. It is fitting, then, that all should join in the spirit of this day, which should, and does, include, among the reverent and thoughtful, a prayer that God in His infinite goodness and mercy will grant a larger share of His bounty to His less fortunate children wherever they may be situated until the fulfillment of the prophecy of peace, contentment, good will, and brotherhood rests upon all the earth.*

*HUBERT WORK,  
Secretary of the Interior.*

1926

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

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HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

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## *Interesting High Lights on the Reclamation Projects*

**T**HE Shoshone project held an election October 2 to vote on the contract between the United States and the Shoshone Irrigation District, providing for transfer of management of the irrigation works of the Garland division and for repayment of construction costs upon a crop production basis. The returns showed 410, representing a total area of 30,957.16 acres and an irrigable area of 25,718.6 acres, in favor of the contract and 8, representing a total area of 397.92 acres and an irrigable area of 378.51 acres, against the contract.

**A**T American Falls Dam, all concrete work was completed at the end of September except 800 cubic yards in one panel of the left abutment section, the parapet walls, and a small amount on the radial gate piers. The earth fill in the right embankment was completed and a considerable amount of material was placed in the left embankment.

**T**HE Great Northern Railway, through its colonization agency, has obtained options on several tracts of land on the Milk River project at very reasonable prices and terms.

**V**ERY satisfactory results are reported from the potato crop on the Milk River project, with high yields and good prices. The sugar beet crop will average more than 10 tons an acre. Indications point to very profitable returns on all crops from the irrigated lands of the project.

**I**NQUIRIES for Belle Fourche project land have been numerous recently. There has been a marked increase of new people on the project and it is expected that 1927 will see much improvement. Listing of land on the standard option form continued, and at the end of September a total of 5,100 acres had been listed.

**D**URING September there was a labor shortage on the Carlsbad project for all work except cotton picking. At the close of the month about 2,000 bales of good grade had been picked, the yield averaging about three-fourths of a bale per acre.

**O**N the Riverton project one applicant who had previously appeared before the Examining Board was accepted and assigned a farm unit. Another applicant made application and appeared before the board.

**A**UTHORITY has been granted for the award of the contract for the construction of Stony Gorge Dam, Orland project, to the Ambursen Dam Co., at a total cost of \$518,904.

**T**HE yield of almonds on the Orland project will exceed that for any year in the history of the project. Eighteen carloads have already been shipped with a few carloads still remaining on the project for later shipment.

**M**OST of the late varieties of potatoes grown on the Uncompahgre project are being held in storage in anticipation of higher prices. It is predicted that \$3 spuds will prevail during November.

**P**POTATOES were the principal crop shipped from the Minidoka project during September, with a total of 258 cars from project towns. A large proportion of the crop will be placed in storage for higher prices.

**M**MORTGAGE loan companies report the sale of several farms to settlers on the Minidoka project, and the general financial condition shows substantial improvement over that of last year.

**M**MANY sugar-beet fields on the Belle Fourche project give promise of well over 20 tons per acre. Cucumbers for pickles also made an excellent showing, a number of farmers receiving returns of \$200 to \$300 per acre. The Nisland pickle station received 15,000 bushels for the season.

**O**WING to the high price of potatoes during the fore part of September, this crop on the Shoshone project was moving to market much more rapidly than in ordinary seasons. During the month 225 cars were shipped from the project.

**T**HE Powell Creamery purchased 11,000 pounds of butterfat during the month, and manufactured 13,300 pounds of butter and 260 gallons of ice cream. Other agencies purchased 2,400 pounds of butterfat for shipment to the creamery at Butte, Mont. About 6,000 pounds of cream were shipped from the Frannie division.

**T**HE Lower Yellowstone project reports that probably the best all-round crop ever produced in the valley has been harvested from the irrigated land this year, particularly with reference to alfalfa and sugar beets. The yield of beets will average about 12 tons an acre.

**G**OOD progress is being made on the construction of the first four miles of the main canal on the Kittitas division of the Yakima project. The report of the appraisal board on land classification and appraisal has been completed.

**T**HE sugar beet harvest on the North Platte project started late in September and at the end of the month four factories were slicing beets. The two new factories at Minitare and Torrington began slicing about the middle of October.

## President Coolidge Approves Owyhee Project Construction

*The Secretary of the Interior concludes that the project is feasible from an engineering and economic standpoint, based on searching investigation of water supply, engineering features, cost of construction, land prices, and probable cost of development*

**P**RESIDENT COOLIDGE on October 12, 1926, approved the construction of the Owyhee irrigation project in Oregon and Idaho, as submitted to him in the following letter from the Secretary of the Interior.

THE SECRETARY OF THE INTERIOR,  
Washington, D. C., October 9, 1926.

THE PRESIDENT,  
The White House.

MY DEAR MR. PRESIDENT: Section 4 of the act of June 25, 1910 (36 Stat. 835) provides in effect that after the date of that act no irrigation project to be constructed under the act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto shall be undertaken unless and until the project shall have been recommended by the Secretary of the Interior and approved by the direct order of the President.

Subsection B, section 4, act of December 5, 1924 (43 Stat. 701), provides as follows:

That no new project or new division of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

The various features requiring investigation and report under subsection B, section 4, act of December 5, 1924, *supra*, will be discussed in the order in which presented in that subsection, as follows:

### WATER SUPPLY

*Source.*—Owyhee River. Has a mean annual flow of 1,004,000 acre-feet, the maximum yearly flow being 2,300,000 acre-feet and minimum 350,000 acre-feet. Small summer flow fully used by Owyhee ditch which requires supplemental water. Future depletion by upstream developments amounting to 30,000 acre-feet annually allowed for. Project requirements, 636,000 acre-feet annually, including Owyhee ditch lands.

*Shortages* in period of 21 years, 54 per cent, 1924; 16 per cent, 1915; 11 per cent, 1905.

The shortages referred to above are based on the assumption that the maximum acreage will be irrigated, and may be eliminated by decrease of acreage. If there is no increase of acreage, it would be possible to increase the water supply by

raising the height of the dam a few feet and increasing the carry-over capacity, which could be done at slightly greater expense.

*Storage capacity.*—Dead storage for diversion elevation, 406,000 acre-feet; live storage, 595,000 acre-feet at Hole-in-Ground Reservoir site.

### ENGINEERING FEATURES

*Storage-diversion dam.*—Concrete arch 355 feet high above foundation, 600 feet long on top, 405,000 cubic yards concrete, channel spillway with 30,000 second-foot capacity.

*Main canals.*—Outlet from reservoir is 15 feet diameter, tunnel  $3\frac{1}{2}$  miles long to division works. Succor Creek branch to supply Gem district and adjacent lands has tunnel  $4\frac{1}{2}$  miles long, 10.2 feet diameter, followed by 60 miles of canal principally in earth. From division works the main canal continues 4 miles, including 1,500 feet of tunnel, 8,000 feet of concrete flume, and a 900-foot steel siphon 114 inches in diameter. From the end of the main canal Mitchell Butte Canal, with maximum capacity of 1,203 second-feet, crosses Owyhee River with siphon 9 feet diameter, 1,730 feet long, and continues 60 miles northerly largely in earth to Malheur River. From end of Mitchell Butte Canal, Dead Ox Flat Canal crosses Malheur River with 8-foot diameter steel

siphon  $2\frac{1}{2}$  miles long, capacity 445 second-feet, thence northerly 35 miles in earth canal to the end opposite the town of Weiser, Idaho.

*Drainage.*—A total of \$993,000 is included in the construction estimate for drainage in all divisions.

### COST OF CONSTRUCTION, BY FEATURES

Storage and diversion.....	\$6, 111, 815
Main canals.....	9, 506, 785
Laterals.....	1, 103, 400
Drainage.....	993, 000
Total.....	17, 715, 000

### TOTAL COST

As shown above, the total cost of \$17,715,000 is for actual construction only, and does not include items for "Operation and maintenance during construction," "Land surveys," and "Investigations." An allowance of \$285,000 has been made to cover the cost of the above items, bringing the gross cost to \$18,000,000.

### LAND PRICES AND PROBABLE COST OF DEVELOPMENT

The Owyhee project comprises about 124,000 acres of irrigable land in the States of Idaho and Oregon. Of this about 70,000 acres are new land covered



The transformation of the desert

with sagebrush and other desert plants, but are not farmed because of the low rainfall. Some 41,000 acres are in districts irrigated from the Snake River by means of pumps, and 13,000 acres are under the Owyhee ditch, which has an insufficient water supply. Fifty-four thousand acres, or more than one-third of the land in the project, is therefore settled, improved, and is now being irrigated.

The unsettled, unimproved, excess lands of this project have been appraised by a competent board which has fixed an average selling price of \$7.42 an acre for all lands of the project and an average of \$10.20 an acre for the irrigable portion thereof. The contracts with the districts and individual landowners require that these prices be adhered to in selling excess land to new settlers. Settlers who are allotted public land will be required to have some capital and farming experience. Application of these principles in settling this project will tend to eliminate some of the obstacles to farm development of the past.

#### **FINDING REGARDING FEASIBILITY OF PROJECT**

The foregoing data justify the conclusion that the project is feasible from an engineering and economic standpoint, and I accordingly so find and declare.

#### **ADAPTABILITY OF LAND TO SETTLEMENT AND FARM HOMES**

The land embraced in the project is of more than average fertility. Rough land and poor soil have been eliminated. The retained land can be prepared for the effective application of water. If properly prepared for irrigation and properly cultivated, good yields of all crops grown in this locality are assured. With care in the selection of settlers, with farms suitably improved and equipped, success in farming may be anticipated.

#### **PROBABLE RETURN TO RECLAMATION FUND OF COST OF CONSTRUCTION**

The next declaration required is that the cost of construction will probably be returned to the reclamation fund. This is interpreted to mean that it will be returned within the period fixed in the contract with the Owyhee district, which is in 40 years from the time the public notice that the works are completed is issued by the Secretary. The works can be completed in five years from June 30, 1927, if Congress will appropriate the necessary money. If completed in 1932, public notice could be issued which would require payments to begin in 1933, and this would give irrigators until 1973 to complete their payments.



Turkeys on an Orland homestead

The construction costs of this project will vary with the classification of the land, but the average will probably be about \$160 an acre, making the average yearly payment \$4 an acre. To this will have to be added the expense of operation and maintenance, and the question which we have to consider is, Can irrigators meet this operation cost and an annual construction payment, varying between \$3 and \$6 an acre, depending on the class in which a particular farm is placed?

While this is a higher construction payment than has been made on older projects like Boise, Minidoka, Strawberry Valley, and North Platte, where conditions of soil and climate approximate those at Owyhee, the total yearly charge will be considerably less than is now being paid by irrigators under the pumping units of this project or on many other private projects. It is believed, therefore, that improvements in methods of development and in agricultural practices which may be expected will increase incomes and ability to meet the required payments on the Owyhee project.

The unwise and immensely injurious effect of land speculation on older projects will be forestalled at Owyhee by the appraisal made of the surplus land and fixing in advance the price settlers are to pay. Provision for giving settlers practical advice for working out crop programs and for the selection of settlers on the public land of the project, all of which are now authorized by law, will help hasten farm development and increase the earnings of farmers.

Settlers on this project will begin the development of farms under the following favorable conditions: Increase in agricultural production in the Nation is not keeping pace with increase in population.

They will realize at the outset that their farms must be intensively cultivated and will be helped to organize for cooperation in production and marketing.

The favorable conditions heretofore recited and the newly established policy of the bureau justify the belief that this project will return the cost thereof.

Because of the urgent need for a larger and cheaper water supply by the settlers on 54,000 acres of this area, because the unimproved land is fertile, suited to the needs of settlers and appropriate for development under the reclamation law, and because the development of this area is destined to greatly benefit the Nation, I recommend its approval and the issuance of the necessary authority to this department to make contracts for its construction and to proceed with the work.

Very truly yours,

HUBERT WORK.

Approved October 12, 1926.

CALVIN COOLIDGE,  
President.

Irrigation is no modern discovery. All that we have learned to do in this latter day is to place our modern civilization safely under the irrigation ditch.

Much experimentation is yet needed before we understand properly and fully the relationships existing among water, soils, and crops.

The real test of success depends upon the ability of the man under the ditch, through a long succession of years, to win from the soil and the water a comfortable and satisfactory living for himself and his family and to pay his obligations.

## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, *New Reclamation Era*

### Help Yourself and Posterity—Plant Shade Trees



An example of the protection given by shade trees

**D**ID the October issue of the ERA start you thinking about beautifying your homestead by planting more shade trees?

I have a treat in store for you. Dr. F. L. Mulford, horticulturist in charge, of the Bureau of Plant Industry, promises to furnish an article on this subject for an early issue of your magazine. I hope you will all watch for it and write in your reaction.

The saying "There is no aid to success like appreciation" applies with double strength to our efforts in trying to make the NEW RECLAMATION ERA as attractive as possible to our water users on the projects.

### Fall and the Problems it Brings

The children have returned to school, harvesting is in process, and the housewife's thoughts naturally turn to preserving and setting her house in order for the long winter months.

The following can be made economically and will often fill a need when the crops are out of the ground and you have to resort to your pantry:

#### CORN SAUCE

3 dozen ears of corn.      ½ cup of salt.  
3 red peppers.            ½ pint cider vinegar.  
3 green peppers.          1½ pounds sugar.  
1 large head cabbage.

Cut fine and cook until tender. For dressing use the following ingredients:

3 pints vinegar.            4 tablespoons ground  
5 tablespoons cornstarch.    mustard.  
1 cup sugar.                1 tablespoon tumeric.

Bring vinegar to boil, then mix cornstarch, sugar, tumeric, ground mustard with a little cold vinegar or water. If vinegar is very strong use half of each, stir into the boiling vinegar until it thickens, then put in vegetables; let stand over fire until thoroughly heated through; then put in jars and make air-tight.

#### PEPPER AND ONION RELISH

6 onions.                    ½ cup parsley leaves.  
6 red peppers.              1 cup sugar.  
6 green peppers.            2 spoonfuls salt.  
2 cups of vinegar.

Peel onions; cut peppers in halves and remove seeds. Chop the onions and peppers fine and a half a cup of parsley leaves. Cover the whole with 1 oiling water, set a plate above and let stand 5 min. Drain and add sugar, salt and vinegar. Let boil 1 hour and seal in small jars.

#### DILL PICKLES

Wash pickles off. Make brine of salt and water strong enough to float an egg. Lay one layer of grapevine leaves at the bottom of the crock. Then put two layers of pickles and one layer of dill, two layers of pickles, etc., until the crock is filled and then put grape leaves on top, then a board and stone. Pour liquor over whole contents and let stand for three weeks, until pickles change color.

#### INDIA RELISH

½ peck green tomatoes.      2 green peppers.  
Small head cabbage.          4 cups sugar.  
1½ quarts vinegar.            1 tablespoon each mustard seed, celery seed, cinnamon, and cloves.  
3 large onions.  
3 red peppers.

Chop tomatoes, sprinkle a little salt over them and let stand overnight; drain liquor off, then add cabbage chopped fine. Boil all in vinegar for one hour, then add onions and peppers chopped fine, sugar, and spices. Boil until tender, then put in glass jars well sealed.

#### GREEN-TOMATO CHOWCHOW

1 peck green tomatoes.      1 cup grated horse-radish.  
8 green peppers.              1 tablespoon ground cloves.  
4 onions.                      1 tablespoon ground cinnamon.  
1 cup brown sugar.  
1 cup salt.

Chop tomatoes, peppers, and onions fine. To this add salt and let stand overnight, after which drain off the water and then add horse-radish and sugar, cloves, and cinnamon. Fill till it stands full with cold vinegar and let it cook gently all day. When done put in jars and seal.

If house cleaning is carefully planned and approached systematically, much of the usual inconvenience and discomfiture of the entire household may be eliminated. Doing away with superfluous shelves and moldings, filling up cracks and crevices in which dirt lodges, and arranging adequate storage space will help.

To accomplish the best results suitable cleaning tools and materials must be at the housewife's disposal. The ideal arrangement is to have a complete set stored in orderly fashion in a convenient, well-ventilated closet. Whether few or many kinds are needed, it is economical to buy well-made, durable tools and keep them in good condition and grouped together if possible. (See illustration on opposite page.)

The initial cost of implements of good quality may be a trifle greater than those of poorer grade, but substantial ones generally give longer and better service and are more economical in the end. A few well-chosen implements require less care than a large collection bought haphazard.

#### TOOLS

The following list gives some of the desirable cleaning tools for farm homes where the luxury of a vacuum cleaner is not enjoyed:

**Brooms and brushes.**—Corn broom for carpets and rough surfaces, such as concrete, brick, and stone.

Soft-hair brush for smooth floors and floor coverings, such as wood, tile, linoleum, oilcloth, and cork carpeting.



Wall brush of lamb's wool, or loops of soft cotton twine, or soft bristles. A bag of cotton flannel slipped over the broom may take the place of a wall brush.

Whisk broom for general use.

Scrub brushes of various sizes for cleaning unfinished wood, sinks, etc. A long-handled one will be found especially convenient for floors.

Paint brushes or special brushes of various shapes and sizes for upholstery, reed furniture, and carved surfaces.

Radiator brush for cleaning between pipes.

Refrigerator brush, with flexible wire handle, for cleaning drainpipe.

**Mops.**—Wet mop for floors that are to be washed with water. A convenient form has soft, loosely woven cloth fastened to the handle by a flat metal clasp. A mop wringer fastened to a pail saves the worker much stooping, keeps the hands from the water, and removes more water from the cloth than would be possible by hand wringing.

Dry mop either untreated or oiled. The latter holds the dust better and renews the finish on painted, varnished, or shellacked floors, but should not be used on waxed surfaces.

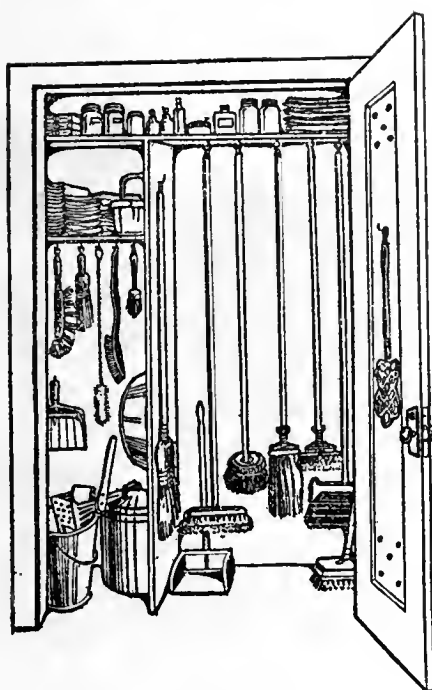
**Dustpan.**—The edge should be firm and should come in direct contact with the floor, and the side to which the handle is attached should be high enough and so shaped as to prevent dirt from falling out. A long-handled dustpan does away with some stooping.

**Dusters.**—A duster should be soft and should shed neither lint nor ravelings; it holds the dust better if dampened or oiled. Silk and chamois are excellent for use on highly polished surfaces. A duster may be moistened by passing it through steam; by wetting one corner of the cloth, rolling it up, and letting it stand for a short time; or by wringing together one dry cloth and one that has been wrung out of water. A dust cloth may be oiled by applying a few drops of kerosene or light lubricating oil on one corner, rolling the cloth and letting it stand until the oil has spread evenly. Cotton waste and paper are good substitutes for dust cloths in cleaning dirty, greasy surfaces. Feather dusters should not be used, except perhaps just before sweeping, for they scatter but do not remove dirt.

**Carpet sweepers.**—Many good kinds of carpet sweepers are on the market and are effective for taking up surface dirt. They are particularly useful for the daily care of rugs and carpets.

**Carpet beaters.**—These may be of wire or of either flat or round reed. Those of flat reed are least hard on the carpet fibers.

**Pails or buckets.**—Galvanized iron or fiber pails are light in weight and durable; the former are cheaper.



### MATERIALS

Besides these tools and a liberal supply of paper and cloths, various materials are used to loosen the dirt and make it easier to remove. All these cleaning materials or agents should be used sparingly. This is not only economical of the cleaners but less likely to injure the surfaces cleaned. Some of those most commonly used are listed below.

**Water.**—Hot water loosens dirt more easily, but it is more likely to injure finishes and fabrics than lukewarm or cold water. Water should not be allowed to stand on floors or woodwork nor to get into cracks or seams; it should, in fact, be used very sparingly and in most cases wiped off at once.

An abundant supply of water piped through the house and a good drainage system for carrying away waste are of first importance in making housecleaning easier, as well as for the health and general comfort of the household.

**Soap.**—A mild soap—that is, one with no free alkali—is less likely to injure finishings and colors than a stronger one. A soap solution makes suds more quickly and cleans more evenly and safely than soap in cake; a quantity may be made at a time, and bits of soap may be used up in this way.

One pound of soap and 3 quarts of water are heated slowly until the soap is dissolved and then the solution is placed in broad-mouthed bottles or jars, for use as needed. Flaked and chipped soaps dissolve more quickly than cake soap. Several kinds are now on the market, and hard cake soap may be chipped at home by being rubbed over a grater.

Soap may be made at home from lye and waste fat, and the directions given on the lye container will generally be found satisfactory. Home-made soaps, however, are likely to contain free alkali and should be used with caution, especially on delicate and colored fabrics, and on paint, varnish, or other finishes.

**Ammonia, borax, and sal soda (washing soda).**—These alkalis are used both to soften hard water and to loosen dirt. Concentrated ammonia bought at a drug store and diluted at home by using about 1 part ammonia to 7 parts water is usually more economical and satisfactory for general cleaning than the dilute form sold as household ammonia. Borax is least likely to injure delicate fabrics, but is the most expensive of these three alkalis. Washing soda is bought in coarse powder form and should be thoroughly dissolved in water before using.

**Gasoline and benzine.**—These are used to dissolve grease and sometimes to control insects; they are so inflammable and explosive that the fire laws of many States allow only very small quantities to be kept in a house. When either of them is used in cleaning, it should be put in a small bottle and kept well corked, except when the liquid is actually being poured out.

The bottle should not be opened in a room in which there is a fire or a gas, oil, or candle flame, or in bright sunshine. Only a little liquid should be poured out at one time.

**Kerosene.**—This is used to cut grease and loosen dirt, and sometimes to repel insects.

**Oils.**—Various kinds of oils are used to renew the finish on shellacked, varnished, and oiled surfaces. Cloths moistened with linseed oil are especially liable to spontaneous combustion and should be either destroyed immediately after use or kept in a tightly covered fire-proof container. Light mineral oils, such as are used for lubricating motors, are less dangerous in this respect and are also cheaper than linseed oil. They may be diluted with eight or ten times their volume of kerosene or gasoline. When the latter is used the mixture is, of course, highly inflammable and must be treated as carefully as pure gasoline.

**Turpentine.**—This is used to dissolve paint, varnish, and wax. It is inflammable and should not be brought near a flame.

**Steel wool.**—This consists of hair-like particles of steel. It is used in scouring certain metals and in removing varnish and paint. Different grades are numbered according to fineness, 00 being the finest. In using it the hands should be protected by old gloves or mittens.

*Furniture polish.*—This is convenient for rubbing up various kinds of woodwork. The United States Bureau of Standards recommends a simple kind, made by mixing 1 part raw linseed oil with 2 parts turpentine and adding a little melted beeswax if desired. Or a light mineral oil diluted with kerosene or gasoline may be used for this purpose.

*Floor wax.*—This is used for giving a polished surface to wood floors. It should be applied in thin coats and well rubbed. It may be bought ready mixed or made at home, as follows:

1. Mix 1 pint of turpentine and 4 ounces beeswax and heat in a vessel set over hot water until the wax is melted. Remove from the heat. Add 3 ounces aqua ammonia (strength 10 per cent) and about 1 pint of water and stir vigorously until the mass is creamy.

2. In a vessel set in hot water melt one-fourth pound beeswax and 1 pound paraffin. Add one-fourth-pint raw linseed oil and  $1\frac{1}{4}$ -pints turpentine and stir the mixture vigorously.

In making both these polishes great care must be taken to heat them only by setting in hot water and to have no open flame in the room for turpentine is very inflammable.

#### IMPROVEMENTS

With the fall house cleaning completed let us consider the addition of one or more timesavers we have been thinking about during the year. This might be a storage closet for linens, a specially equipped corner for cleaning utensils, an additional convenient table in the kitchen, etc. You can not appreciate the helpfulness of these until you have worked with them, and the effort made in installing one or the other of these conveniences is more than repaid by the steps and time they save you during the year.

"Better community" meetings fostered by women's clubs are an established institution on a number of the projects.

To keep yolk of egg fresh, if only the white is needed, cover the yolk gently with a little cold water so as not to break it. It will keep fresh for several days.

The need for strong cooperative marketing associations can not be overemphasized. They are absolutely necessary to bring about efficient and economical marketing and standardization of crops, but the movement should be truly cooperative and should be controlled by its membership.



Reclamation of arid lands doesn't only mean good crops. It means good houses as well

## Regulations for Taking Crop and Livestock Census

On Federal reclamation projects for year ending December 31, 1926

**T**HE crop and livestock census for the year 1926 on Federal reclamation projects shall be taken by employees of the bureau under the direction and supervision of the project superintendent, except on projects which have been turned over to the water users, when the census shall be taken by employees of the water users' association or irrigation district under the direction of the manager or superintendent of the association or district. The methods employed will be similar to those followed in 1925, except as hereinafter explained.

#### CENSUS FORMS

The record forms to be used by the enumerator will be the usual Bureau of Reclamation Form 7-332, as modified in 1925. The Washington office of the Bureau of Reclamation has a supply of these forms on hand, and the various projects should request the number required for this year. Surplus forms on hand from the 1925 supply may be used this year, and this should be taken into account when requesting forms. The form enumerates most varieties of crops produced and stock kept on the various projects. Blanks are provided on the form for listing additional items. Automobiles, trucks, and tractors should be listed and valued separately from other farm equipment, which should be valued as a lump sum.

#### ACCURACY OF RECORDS

The Bureau of Reclamation has found the crop and stock census data taken annually in past years to have great value for reference. Under section 4 of the act of December 5, 1924 (43 Stat. 672, 701), which provides for repayment of construction costs on the basis of the average gross annual acre income, these census data become of paramount importance and should be collected with great care. The enumerators should interview the farmer and secure his cooperation if possible. Absentee owners and other conditions will necessitate the use of good judgment based on the best information obtainable. Form 7-332 should be dated and signed by the owner where possible, otherwise by the enumerator.

#### SUPERVISOR

The project superintendent shall be the supervisor of the census on projects being operated by the United States. On projects being operated by the water users the manager or superintendent of the water users' association or irrigation district shall be the supervisor of the census. The project superintendent, or the manager or superintendent of the water users' association or irrigation district, as the case may be, shall appoint the enumerators and review their work. He shall confer with leading produce and commission men

and water users of the project and determine the values to be applied to the various crops. He shall have prepared, under his direction, the necessary summaries of all data collected and transmit the original copy to the Washington office of the Bureau of Reclamation and a duplicate copy to the Denver office of the Bureau of Reclamation. Before the census shall be of any effect on those projects which have been turned over to the water users it is necessary that the Secretary of the Interior approve these summaries.

#### INSTRUCTION FURNISHED

In order that uniform methods shall prevail and accurate results be obtained, the Bureau of Reclamation will detail temporarily one of its employees experienced in crop-census methods and procedure to visit each project which has been taken over by the water users and as to which the contract between the United States and the water users, with respect to the project provides for repayment of the construction cost on the basis of the average gross annual acre income as provided by the said act of December 5, 1924. This employee will confer with the water users' association or irrigation district and explain fully to the supervisor of the census and the enumerators the method of taking and compiling the crop census and assist the supervisor in arriving at correct values to be applied to the various crops.

#### INFORMATION SHOWN

The crop census shall show, with respect to each farm, the total number of irrigable and irrigated acres, the number of acres of the various crops grown, the yields per acre, and the values of such crops. Supplemental data showing whether the crops were sold, fed, or stored should be shown.

#### HOW TO VALUE

Many farmers will not have sold their crops; then the enumerator shall place a value upon such crops in accordance with the unit prices as fixed in general by the supervisor; others will have fed hay and grain to livestock, and the value of such crops shall be determined as if the crops had been sold. Hay, fodder, or other harvested forage shall be valued in the stack on the farm. Crops such as grain, beans, potatoes, seeds, etc., shall be valued f. o. b. ears, shipping point, exclusive of the cost of containers. Fruits, berries, and vegetables shall be valued f. o. b. cars, shipping point or warehouse, exclusive of the cost of grading, packing, storing, and containers. All factory crops, such as sugar beets, string beans, cucum-

bers, tomatoes, etc., shall be valued at the selling price to factories or dealers (including estimated bonuses) f. o. b. shipping point, when not delivered direct to the factory. Grain crops which were not harvested for hay or grain should be included as pasture. A distinction should be made in value between tame and wild irrigated pasture and the value should be a reasonable annual rental for such pasture. Straw, sugar-beet tops, hay and grain stubble, etc., and other by-products should be listed and valued. All gardens and miscellaneous crops should be listed and valued.

### Project Chief Clerk Prize Winner at Fair

E. R. Scheppelmann, chief clerk of the Lower Yellowstone project, is also a gardener, as will be shown from the following record of prizes taken by his garden products at the Richland County Fair, Montana:

*First prize.*—Tomatoes, carrots, celery, and turnips.

*Second prize.*—Cucumbers (lemon), parsnips, parsley, summer squash, onions (white), and Swiss chard.

*Third prize.*—String beans, cabbage, and strawberries.

### Klamath County Fair Reflects Improvement

The 1926 Klamath County Fair was held September 16 to 18 and indicated improved agricultural conditions along many lines. The dairy show was 100 per cent greater than any previous dairy exhibit, totaling 145 head, of which 92 were Holsteins, an increase of 300 per cent over any previous Holstein exhibit.

Aberdeen Angus, Herefords, and Short-horns were shown in the beef division. Entries of sheep and hogs were double those shown last year and the quality was better. Poultry showed a slight increase and rabbits an increase of about 800 per cent. The rabbit show numbered 110 entries and was adjudged one of the best in southern Oregon.

The variety of general farm produce was somewhat greater owing to the growing of considerable corn, watermelons, and other produce not grown each year. From the corn shown it is believed that this will be an annual crop when once it is established.

The four community booths were much better than in any previous year. First prize went to Langell Valley, second to the Central Community Club, third to Bonanza, and fourth to Malin. Club work, domestic science, art, culinary, and flowers were all particularly good and up to the standards of former fairs.



Employee's garden on Lower Yellowstone project

## Van Ryneveld's Pass Irrigation Scheme, South Africa

*A planned irrigation development which will be watched with interest by other countries—Capital requirements for a 30-acre farm unit range from \$7,500 to \$10,000—Settlers aided and directed in early years*

AN interesting irrigation project was completed recently in Cape Province, South Africa, near the city of Graaf Reinet. This project, known as the Van Ryneveld's Pass irrigation scheme, was initiated in 1919 and constructed under the supervision of the South African irrigation department. Construction began in July, 1921, and is practically completed at this time. It includes a storage reservoir of 64,000 acre-feet capacity on the Sunday River, about 1 mile northwest of the town of Graaf Reinet.

A series of pickup weirs down the river divert the flow into a number of canals and cover an irrigable area of from 8,400 to 10,000 morgen of very fertile soil. (One morgen equals 2½ acres.)

The following data will give a fair idea of the reservoir and dam:

Catchment area, 1,477 square miles.

Length of dam at the crest, 1,250 feet.

Crest width (over all), 10 feet.

Footway, 7¼ feet.

Batter-face, vertical.

Batter-rear, 0.5 to 1 and 0.65 to 1.

Top of parapet wall, 2,597.75 feet above mean sea level.

Road level, 2,593.25 feet above mean sea level.

High-flood level, 2,590 feet above mean sea level.

Full-supply level, 2,584 feet above mean sea level.

Lowest foundation level, 2,441 feet above mean sea level.

Outlet level, 2,510 feet above mean sea level.

River-bed level, 2,484 feet above mean sea level.

Gross capacity of full-supply level, 64,000 acre feet, i. e., 17,424,000,000 gallons.

Water-surface area at high-flood level, 3,408 acres.

Water-surface area at full-supply level, 2,800 acres.

Quantity of concrete in main wall, 135,058 cubic yards.

The major distributing system embraces 60 miles of canal including some 200 major concrete structures, such as weirs, causeways, flumes, bridges, drops, regulators, and distributary outlets. The estimated cost was \$2,250,000, but it is expected that the final cost will come well within \$2,000,000.

The funds required for the construction of the major features of the irrigation system were voted by the Union Parliament and are repayable in 40 equal

annual installments with 5 per cent interest, payment commencing 2 years after the official date of the completion of the works. In this case these construction costs amount to about \$100 per acre. The annual construction charges payable to the Government and to the Schlesinger Co. amount to approximately 28 shillings (about \$7 per acre) and the operation and maintenance charges for the major system about 3½ shillings per acre, making a total of about \$7.90 per acre per annum.

The settlement feature appears to be largely in the hands of the Schlesinger Co. (of New York) who purchased about 95 per cent of the land. This company has undertaken the building of the roads and of all the subsidiary canals and laterals necessary to bring the water to the settlers' land. The essential features of the settlement scheme are outlined by the secretary of the Schlesinger Co. (incorporated as the African Irrigated Land Co. Ltd.) in a letter to one of the members of the district irrigation board as follows:

Price of irrigable, land £45 per acre.

Price of nonirrigable land, £2 10s. per acre.

Price of small building plots adjoining settlers irrigable land, £12 10s per acre.

Price of small building plots not adjoining settlers irrigable land, £6 5s. per acre.

Training, free, for 12 months. Thereafter settlers will be advised and instructed for some years while working their own holdings.

Boarding fees (including laundry and medical attendance), £6 5s. per month, much less than cost.

Purchasers are entitled within three months to exchange their first holdings for others of equal value which they like better.

Size of holding recommended, 30 acres irrigable land. Dry land according to special requirements.

Ground is sold cleared and ready for plowing. All development work, maintenance of orchards, growing of lucerne and other crops, erecting of fences, etc., is done at cost price plus 10 per cent, the latter being intended to cover cost of supervision and administration, and not as a profit in the ordinary sense. Settlers may of course make their own arrangements instead of using the company's contract department.

Subsidiary canals are constructed by the company, bringing the water to the settler's ground.

Estimate of capital required to put a man on his feet—that is, to get his 30 acres planted, house built, animals purchased, to maintain him for two years, and to put everything into running order, £1,500 to £2,000. (Some men could make good with much less, but we do not

accept settlers with less, unless in very exceptional circumstances.)

In addition to outright purchasers we also have option holders, who hitherto have been entitled to train for six months free, the same as purchasers, and then purchase or not as they thought well. The six months' period is now about to be reduced to one month.

Houses are not built for settlers but the company sells them bricks at a cheap rate (present price 30s. 9d. per 1,000 good burnt bricks) and they are entitled to the services of the company's builder as far as plans, estimates, advice, and a certain amount of supervision of their building are concerned.

As soon as sufficient pigs are raised by settlers a bacon factory will be established by the company. Similarly, a creamery will be established in due course, and both these concerns handed over to the settlers.

Settlers will be assisted to form a cooperative society for the purchase of their stores and marketing of their produce. Export facilities will be provided. These are not nebulous promises but definite undertakings.

It is well to observe that the capital requirements for a 30-acre unit are given as ranging from \$7,500 to \$10,000. This agrees fairly well with the results of the similar economic studies made by the Reclamation Bureau on new or proposed projects, considering the greater initial outlay and the greater demands made on the settler during the early years of settlement. This is a further illustration of the fact that the traditional pioneer system of settling irrigation projects, of starting with little or no financial or equivalent preparedness is a thing of the past. It is safe to say that even with the fulfillment of these demands the successful progress and outcome of the scheme will depend much upon the business sagacity, the leadership, and the intelligent cooperation of all affected interests which the projectors of this settlement scheme may be able to bring about and to maintain throughout the first decade or more.

The experience of our neighbors in this undertaking will be viewed with fraternal interest, realizing that principles and methods, which may prove successful in one locality are likely to produce favorable results here if applied with such modifications as conditions and good judgment may impose.

Great opportunity exists for the cutting down of the cost of farm operations through the reduction in the labor requirements of each operation and by a better application of the power used.



## *Boys' and Girls' Club Work*

### *Genola District, Strawberry Valley Project, Utah*

**A**N interesting and unusual story of achievement in boys' and girls' club work in the little community of Genola under the Strawberry Valley project, Utah, and what this club work has done to develop and sustain an optimistic spirit in the district was disclosed at the recent "Achievement Day Celebration" of the Fourth Annual Community Fair held on September 18 at the Genola School House.

This community is believed to be the only one in Utah with a 100 per cent enrollment in boys' and girls' club work. At the start of this year, the second in club work, there were 68 boys and girls enrolled. During the year 4 moved away from the community, but the remaining 64 have carried on 72 projects to completion. There are six clubs in the community, three in which the boys specialized in general farm crops, one for those interested in livestock, and two for the girls to learn the science of sewing and cooking.

During the present year, the clubs have held monthly meetings and each has brought to Genola some outside speaker to give them pointers upon club work. Supplementing these club-work programs, were entertainment numbers provided by the members. The effect of these programs has been to build up a strong community spirit. The parents became interested in the programs and so became as regular in their attendance as the members and as equally interested in the success of the numerous projects under way.

#### *CLUB INTRODUCES SPANISH ONIONS*

It is not frequent that one hears of junior club organizations of this kind being instrumental in the introduction of a new industry, but the Genola organization has this distinction. The club members were the first to raise the sweet Spanish onion on a commercial scale. Since their experiment with this product others have adopted it with pleasing success. The efforts of the club workers were also, in a large degree, responsible for the Utah Packing Corporation extending its territory to include Genola. During the last two years canning crops have been given special attention in club programs and next spring string beans for canning will be added to the list. The club workers were also largely responsible for the Genola community exhibit at the county fair.

#### *SELF-FINANCED*

As the record of this community of club workers has been unusual in achievement, so has it been unusual in the way it was financed. The club members have financed themselves ever since it began. In addition to this, considerable has been saved from the sale of crops to constitute a fund sufficiently large to insure cash awards to the winning club exhibitors at the local community fair. The clubs at Genola never have asked a dollar donation. It is this record of which the club is particularly proud.

Last year the club members realized approximately \$3,200 from the sale of their products. This meant an average return of \$142 per acre and \$145 for each club member.

This year is the first for the girls' clubs. These new units will be important factors in next year's "Achievement Day Celebration."

Mr. Cecil Nelson is director of all club activities and Mr. E. P. Price is the county agricultural agent.

Power and labor together account for approximately 60 per cent of the total cost of farming; and a better knowledge of the power requirements of farm operations and the adoption of more efficient types of power units will do much to cut down production costs.

## *Irrigation Projects*

### *in Alberta, Canada*

The following table, taken from NATURAL RESOURCES, published by the department of the interior, Ottawa, Canada, shows the irrigation projects in Alberta, Canada, now in operation or under construction:

Project	Source	Area	
		Irri- gable	Irriga- ted to date
	<i>River</i>	<i>Acres</i>	<i>Acres</i>
C. P. R. Lethbridge.....	St. Mary..	130,000	81,110
C. P. R. Western.....	Bow.....	218,980	49,752
C. P. R. Eastern.....	Bow.....	400,000	93,375
Canada L. & I. Co.....	Bow.....	202,640	10,174
Taber I. D.....	St. Mary..	17,000	13,863
Lethbridge Nor. I. D.....	Oldman..	105,000	45,016
United I. D.....	Belly.....	36,000	7,230
New West I. D.....	Bow.....	4,500	3,552
Raymond I. D.....	St. Mary..	68,000	-----
Magrath I. D.....	St. Mary..	51,000	-----

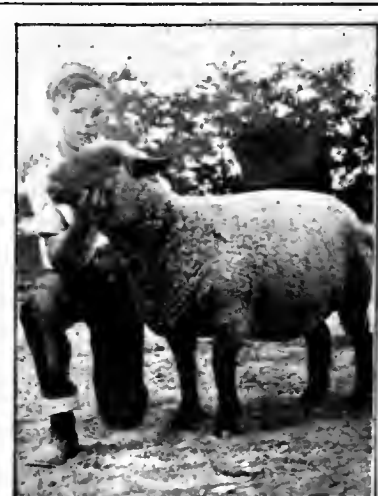
In addition to these larger projects there are 496 small individual schemes within the province, for which water has been appropriated. The combined irrigable area of these smaller schemes is about 60,000 acres. The value of all irrigated crops raised in the Lethbridge district during the last five years is \$25.17.

The plan for the Colorado River development provides for the building of the project through a Federal-bond issue with a unified power plant under the central control of the Government.



How many pies would these Uncompahgre pumpkins make?





## PRODUCTS OF PAYSON SHEEP CLUB

STRAWBERRY VALLEY PROJECT, UTAH

## The Payson Sheep Club

Strawberry Valley Project, Utah

By Heber A. Curtis, Payson, Utah

**D**URING February, 1926, a club of 21 Payson boys, under the leadership of Prof. R. L. Clegg of the agricultural department of the high school, organized a sheep club with Ned McBeth as president and George Starke as secretary and treasurer.

The club was formed on the assumption that the average farm in the community could profitably support a small flock of sheep without much additional expense and with considerably more profit than any other possible combination.

The plan as outlined by the boys was put up to the directors of the State Bank of Payson and the idea approved by them. Money was borrowed from the institution and a flock of registered Hampshire ewes bought from the Belleview Farm and distributed among the club members. From the very first, success attended the undertaking, for during the lambing season 200 per cent increases were recorded in many cases and especially good growth was registered in all the lambs.

### FAIR AND SALE SUCCESSFUL

On August 21, 1926, the club held a fair and sale at Payson, Utah, at which some very good stock was exhibited. Local business and State organizations contributed freely, which assisted materially in making the day a success. The following out-of-town organizations made donations and contributions to help the club: Bankers' Trust Co. and National Copper Bank, Salt Lake City, Utah; Salt Lake Union Stock Yards and Salt Lake Stamp Co., Salt Lake City, Utah; American Sheep Breeders Association, and National Wool Growers Association.

Altogether about \$200 in prizes were given away. Mr. Rulon Dixon, of Provo, Utah, acted as judge and the following club members were awarded prizes:

*Best appearance.*—First, George Davis; second, Max Cowan; third, Dean Schaerrer; fourth, Sterling Tanner.

*Best flock (four or more animals).*—First, Dean Schaerrer; second, George Davis; third, Max Cowan; fourth, Roy Hansen.

*Best ram lamb.*—First, Dean Schaerrer; second, Roy Hansen; third, George Davis; fourth, Roy Hansen.

*Best ewe lamb.*—First, George Davis; second, Dean Schaerrer; third, Dean Schaerrer; fourth, Frank Mortensen.

*Best ewe and lamb.*—First, Levi Hunt; second, Farrel Olsen; third, Ned Hancock; fourth, Ned McBeth.

*Best pair of twins or triplets.*—First, George Davis; second, Frank Mortensen; third, Farrel Olsen; fourth, Ned McBeth.

*Best 2-year-old ewe.*—First, Sterling Tanner; second, Max Wignall; third, Farrel Olsen; fourth, Ned McBeth.

*Best aged ewe.*—First, Dean Schaerrer; second, George Stark; third, George Stark; fourth, Ned Hancock.

About 150 head of sheep were on exhibition and a large number of sheep breeders attended the sale. Mr. Crandall, of the Mount Haggan Land & Livestock Co., of Anaconda, Mont., and Mrs. Miller, president of the Hampshire Sheep Association of America, were present, and assisted in every way to make the show a success. A large number of rams were sold at good prices. The day ended with a swim at the Arrow Head resort.

### REPRESENTED AT NATIONAL RAM SALE

The club also had a pen of ram lambs at the national ram sale at North Salt Lake Stockyards. In all cases the stock of the club measured up favorably with any of those sold. The members have disposed of most of their rams at very good prices and have every reason to feel elated at their show. They contemplate a substantial increase in their flocks by purchase of additional ewe lambs.

The work of this club is being felt by the farmers and business men of the community. They are learning, through the boys, the value of better breeding stock and are already putting this knowledge into practice.

Some of the local flocks will be headed by rams from the club. The boys anticipate a much more successful year during 1927 than during 1926, as they will better understand how to care for and fit the sheep than prior to the club's organization.

Aside from the material benefits accruing to the boys through the sale of sheep and lambs, and the experience gained in caring for them, it has afforded an outlet for the boys' energies by occupying their spare time in something worth while, as well as in many cases interesting their parents in the value of purebred sheep.

Roberto Rosauer, a farmer and cattle raiser from the Argentine, who is very much interested in irrigation, called several times at the Yakima project office.

## Practical Hog Houses An Important Factor

Proper housing is an important factor in the successful raising of hogs. Too often this is neglected, when little expense and effort would be required to provide good, serviceable, well-ventilated houses which give ample protection from cold and admit much needed sunshine.

The same kind of housing for hogs does not apply to all parts of the country. In Farmers' Bulletin 1487-F a number of practical hog houses for several sections of the country are described. One of the chief criticisms which may be made of the average hog house is that it is poorly lighted and ventilated, if in fact any provision at all has been made for ventilation.

The bulletin contains illustrations and floor plans showing how proper ventilation and lighting is secured in the different styles of houses. A copy of the publication may be secured as long as the supply lasts by writing to the United States Department of Agriculture, Washington, D. C.

## Crop Rotation May Equal Fertilizer

In the practice of crop rotation a water user has at his command a means whereby he can materially reduce acre costs or increase the output of his land. Crop rotation is nearly as effective in increasing soil productivity as the use of manure and commercial fertilizers. Furthermore, crop rotation can be practiced usually with no outlay of money, whereas the use of commercial fertilizers requires an expenditure of money.

The beneficial effects of crop rotation are different from the benefits derived from the use of fertilizers; so that when these two farm practices are combined the one practice adds to the benefits of the other, making the resultant increase almost twice that secured by either practice used alone.

On soils long under cultivation highest yields are possible only when rotation and the use of fertilizers are practiced together.

The Colorado River development contemplates the construction of an immense dam at Boulder Canyon, raising the water level of the river higher than the Washington Monument.

Dairy records, by showing feed consumed and production of milk and butterfat, make it possible to feed intelligently and eliminate inferior animals.

## Power Development on the North Platte Irrigation Project

*Construction of Lingle power plant saves Government more than \$1,000,000 in construction cost of Fort Laramie Canal—Enlarged plant used for Guernsey Dam construction and to supply power to commercial customers*

HOW the Government was saved over \$1,000,000 in excavation costs is interestingly described in a recent report by H. H. McPhail, engineer, on power development on the North Platte project, Nebraska-Wyoming. In September, 1917, under specifications No. 369 covering earthwork and structures for the Fort Laramie Canal, bids of \$0.223 and \$0.212 per yard were received for excavating a total of 2,900,000 cubic yards. These high bids brought up the question of power development for construction purposes. In comparing excavation costs, four methods of construction were considered by contract, and by force account with either a hydroelectric plant, a steam plant, or an oil engine plant as the source of power. The latter two were quickly eliminated, and comparative estimates on the first two indicated that by force account the work could be done at a field cost of \$0.1561 per yard, or about 6 cents less than by contract. Actual results up to December 1, 1924, showed 8,500,900 yards moved at an average total cost per yard of \$0.1058.

While a site near Mitchell, Nebr., was given early consideration, the site selected in November, 1917, was on the Fort Laramie Canal, about 2½ miles southwest of Lingle, Wyo., where 100 feet of head was available. The original Lingle plant comprised two 375 kilovolt-ampere generators and two 450 horsepower turbines. Location of the forebay was at station 1333+27 of the Fort Laramie Canal. The plant building is about 800 feet from the canal and a tailrace 1,200 feet long connects with the North Platte River. The penstock was of wood-stave construction and 54 inches inside diameter. Construction was commenced in March, 1918, and the plant was placed in permanent operation on May 1, 1919. Total cost of the plant was approximately \$100,000, or a unit cost of \$132 per kilovolt-ampere or \$110 per horsepower.

During the year 1924 applications for purchase of power were received from the towns of Guernsey and Wheatland, Wyo., and from the Sunrise Mines of the Colorado Fuel & Iron Co. Construction of the Guernsey Dam, requiring a considerable amount of power for construction purposes, was also contemplated. As more than half of the installed capacity of the 750 kilovolt-ampere Lingle plant was then contracted to commercial customers, it was evident that more power capacity

should be installed, if new customers were to be added and provision made for Guernsey Dam construction requirements.

A 1,000 kilovolt-ampere, two-unit hydroelectric plant at the Tieton Dam, Wash., contained two turbines similar to those at Lingle except for size, designed for operation at 70-foot head, but usable at the head available at Lingle. On completion of the Tieton Dam these two units were transferred to the Lingle plant, which was suitably enlarged to receive them. As the enlarged plant was to be a permanent feature, the old wood frame superstructure was replaced by reinforced concrete. A second forebay like the original and a second penstock of plate steel construction 66 inches in diameter were installed to supply water to the new units.

Considerable opposition developed on the project to enlargement of the plant and the addition of commercial customers on the ground that the Fort Laramie Canal would not have sufficient capacity to carry power water during the irrigation season. This opposition was withdrawn as soon as construction of the Guernsey Dam and power plant was assured.

To supplement the winter power water supply for the Lingle plant, a short diversion canal was constructed from the Laramie River into the Fort Laramie Canal. This diversion will not only save storage water in the future, but has the effect of increasing the firm power of the power system by at least 300 or 400 kilowatts. The total cost of the enlarged plant was about \$187,000, or a unit cost of \$107 per kilovolt-ampere, or \$81 per horsepower. Work of enlargement was in progress from November, 1924, to April, 1926.

The transmission system has about 139 miles of line and nearly parallels the North Platte River on its south side from near Guernsey, Wyo., to near Gering, Nebr., with branch lines to the various towns between and to the town of Wheatland, Wyo., southwest of Guernsey. Transmission voltage is approximately 33,000. The east main line to Gering is 51 miles, the Lingle-Guernsey line, 27 miles, and the Guernsey-Wheatland branch 24 miles in length.

Four portable substations were used during the construction of the Fort Laramie division canal to supply power to the dragline excavator distribution lines at

4,000 volts. There are at present two substations that are of more or less permanent character—one at Scottsbluff and the other at Guernsey Dam. With these two exceptions, all customers have been required to supply their own substations for receiving power. On January 1, 1926, there were nine of these stations—at Torrington, Lingle, Morrell, Mitchell, Yoder, Lyman, Guernsey, Wheatland, and Sunrise Mines.

The United States had a total investment in January, 1926, of \$351,847.75, the transfer value only of that portion installed up to December 31, 1924, being considered. This amount includes costs of power plant, substations, transmission lines, permanent cottages and garages, and the Laramie River diversion. Distribution to the various divisions is made as follows: Interstate, \$164,686.90; Fort Laramie, \$162,685.23; Northport, \$24,475.62. The plant has a creditable record for continuous operation, with a total length of interruptions of 339 hours in six years and two months of operation.

The average operation and maintenance cost per kilowatt-hour has been \$0.02171, and the average return from commercial customers per kilowatt-hour delivered has been \$0.0281. Gross returns from commercial customers for the year 1925 were \$58,208.35 and total returns up to December 31, 1925, were \$292,662.51. All power used by the United States has so far been charged out at cost, the depreciation on the system up to December 31, 1924, when it was transferred to a permanent power system, however, being absorbed by the construction work.

For the first few months of operation of the Lingle plant, the power output was used entirely for construction and Government camp purposes. Torrington, the first commercial customer, was added in December, 1919, followed by other towns and the Dutch Flats drainage pumping plant in 1920. By 1921 practically half of the plant output was being sold to commercial customers. At the end of the construction period in 1924, the load became practically all commercial. On April 1, 1926, the project power system was delivering power to nine commercial customers. Contracts covering the sale of power follow the standard Bureau of Reclamation form, with one standard rate and only a few slight variations as to discounts.

## Organization Activities and Project Visitors

**D. R. ELWOOD MEAD**, commissioner of reclamation, had hardly returned to the Washington office from his trip to Haiti to investigate one of the irrigation possibilities there when he was called upon to go to Cuba for a like purpose, returning early in October.

**H. W. Nicolsen**, senior engineer of the irrigation service of Punjab, India, was in the Denver office recently making up an itinerary for a trip throughout the Western States to obtain information concerning methods of construction of high dams. He will visit a number of our projects.

**Stan Spacek**, a representative of the Czechoslovakian Government, met the chief engineer and the designing engineer of the Denver office recently as the first step in an inspection of the reclamation projects where construction is going on and especially the building of dams.

**J. J. Doland**, assistant engineer in the Denver office has resigned to accept a position as instructor in the College of Engineering, University of Illinois.

**Price O. Craven**, senior clerk in the Denver office, has resigned.

**A. C. Cooley** of the United States Department of Agriculture, **Mr. Ruzicka**, county agent, and **Mr. Oliphant**, assistant county agent, visited the Huntley project recently to consult with Superintendent McGinness in regard to carrying on the demonstration work on the project.

**T. R. Smith**, junior engineer, in charge of hydrography at American Falls Dam, has been transferred to the Denver office.

**N. C. Grover**, chief hydraulic engineer of the Geological Survey, was a recent visitor at American Falls Dam.

Recent visitors to the Milk River project included **C. D. Greenfield**, settlement agent of the Great Northern Railway; **A. C. Cooley** of the United States Department of Agriculture; and **S. G. Dawson** and **W. T. McFarland** of the Canadian reclamation service.

District Counsel **Alexander** was on the Grand Valley project recently preparing the draft of a repayment contract and public notice.

**Copley Amory**, expert in reclamation economics, has returned to the Washington office after a month's trip through several of the Atlantic seacoast States in connection with the bureau's study of planned rural development.

An engineering board consisting of **Louis C. Hill**, consulting engineer; **S. O. Harper**, construction engineer; and **Ora McDermith**, consulting engineer, spent several days on the Carlsbad project making studies relative to increasing storage facilities for the project.

**Dr. Hugh A. Brown**, Chief of the Division of Settlement and Economic Operations of the Washington office, left on October 17 for a trip through the Southern States to meet the various governors and other State representatives and to discuss plans for the visit later in the year of a commission of three experts along agricultural, settlement, and economic lines in connection with the bureau's study of planned community development in the South.

**Mr. F. A. Kern**, Secretary of the Kittitas Reclamation District, paid a personal visit at Reclamation headquarters in Washington while on other business in the East.

**Doctor Nelson**, Chief of the Biological Survey, accompanied by **Ray Steel**, in charge of this work in Oregon, and **George Tonquin**, in charge of similar work in California, called recently at the Klamath project office to discuss local conditions as affecting the life of migratory birds.

**C. C. Cragin**, general manager of the Salt River Valley Water Users' Association, is in Washington to secure approval of a contract for additional sale of electric power which will add \$250,000 to the annual revenues to the Salt River project.

**George C. Kreutzer**, director of reclamation economics, conferred recently with owners of unimproved lands on the Orland project.

**E. B. Debler**, **J. L. Lytel**, and **A. W. Walker** convened on the Klamath project as a board to report on the reclamation of Tule Lake.

General Foreman **Charles Farmer** has been in charge of the installation of the sixth unit at the Minidoka power house, Minidoka project.

**M. G. Cutting**, agricultural writer for the Country Gentleman, visited the Belle Fourche project recently to gather material for an article dealing with the farmers' stand on present reclamation policies.

**Glenn F. Engle**, assistant engineer on the Newlands project, has resigned to devote all of his time to his ranch interests.

**H. F. McPhail**, electrical engineer in the Denver office, made a study recently of the proposed pumping site at Shell Rock Point, Okanogan project. He also ran out trial lines for the proposed pump main from the river to the project canals, and looked over the McLaughlin Canyon dam site and the possibility of storage of water in Osoyoos Lake.

**B. T. Ploeger**, levelman on the Shoshone project, has resigned to accept employment on the municipal water supply works for the East Bay cities, California.

**J. R. Iakish**, associate engineer on the Shoshone project, has been transferred to drainage investigations on the Vale project, Oregon.

**William H. Tuller** has been elected by the Board of Control, manager of the Boise project to succeed **J. B. Bond**, who has resigned to accept a position with an engineering concern in Mexico.

**B. A. Shumakov**, irrigation engineer from Russia, was a recent visitor on the Yuma project. He was interested particularly in the Laguna Dam.

A board of engineers, comprising **D. C. Henny**, **S. O. Harper**, and **L. M. Lawson**, convened at the Rio Grande project office to consider plans and make recommendations for the construction of a main diversion canal in the lower part of the El Paso Valley, and for the purpose of consolidating diversions and preventing the unauthorized use of water.

**J. F. Partridge**, engineer for the California-Oregon Power Co., conferred recently with **H. K. Smith**, hydrographer, Klamath project, in regard to the control of Upper Klamath Lake.



## Contracts Under the Act of December 5, 1924, Umatilla Project

A CONTRACT has been entered into between the United States and the West Extension irrigation district, providing for the transfer of the management of certain of the Umatilla project works to the district and for the repayment of construction costs upon a crop production basis. The contract is dated April 27, 1926, and consists of 18 typewritten pages. After the formal preamble and certain explanatory recitals, the contract provides for the transfer to the district of the care, operation and maintenance of the Three Mile Falls Dam and all canals, sublaterals, ditches, structures, distribution and drainage systems, and other works constituting that part of the Umatilla project irrigation system theretofore operated by the United States in connection with the irrigation of lands of the district. The district agrees to maintain and operate the works in a careful and proper manner. The United States reserves the right to inspect the transferred works from time to time to ascertain whether they are being properly maintained.

### PAYMENT ON CROP RETURN BASIS

The contract then provides for the payment of the construction charges on a crop-return basis, the following being the language used in this part of the contract: "The installment of the construction charge per irrigable acre of project lands in the district payable each year shall be 5 per cent (5%) of the average gross annual acre income (as determined by the Secretary) for the 10 calendar years first preceding the year

in which such installment comes due of the area of the project land in cultivation in the district as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive. The Secretary will determine the average gross acre income from said lands for the 10 years preceding the year 1927, and will notify the district of his findings thereon, and of the charge per irrigable acre based on 5 per cent of the said average gross acre income; and it is agreed that the annual construction installments for the project lands of the district shall be on the basis of the said rate per irrigable acre as determined by the Secretary multiplied by the number of irrigable acres (for which water is available as determined by the Secretary) as said irrigable acreage is shown at the time on the official farm unit plats of the west division of the Umatilla project, until modified by notice from the Secretary of his findings in regard to average gross acre income for said project lands of the district during future years."

Any owner of project lands in the district who does not desire to accept the new basis of payment is to be permitted to continue on the old basis, upon his advising the district in writing on or before September 1, 1926, that he does not wish to make his payments on the crop-return basis.

### REDUCTION OF PENALTY

Before the contract became effective the district was obligated to pay a penalty at the rate of 1 per cent per month upon all charges due from the district to the

United States and not paid when due. The contract reduces this penalty to one-half of 1 per cent per month, as permitted by section 4 of the act of December 5, 1924, this reduction in penalty, however, being applicable only to charges becoming due subsequent to December 5, 1924.

Beginning with the year 1926 the board of directors of the district assumes the duty and responsibility of determining and announcing the annual operation and maintenance charges for the lands of the district. These charges are to be collected in advance beginning with the year 1927 and no water is to be delivered until such charges are paid. The district is also empowered to levy a toll charge to meet the annual cost of operation and maintenance.

### EMPLOYMENT OF PROJECT MANAGER

The United States is to turn over to the district certain of the operation and maintenance equipment, and the cost thereof is to be included in the construction charge payable by the district. During the period before the construction charges are paid in full, the district is to employ a project manager satisfactory to the Secretary of the Interior, and the contract gives the Secretary the power to discharge such manager if his services become unsatisfactory. Such an article is necessary to protect the rights of the United States during the time when the district is indebted to the Government for the construction cost of the project.

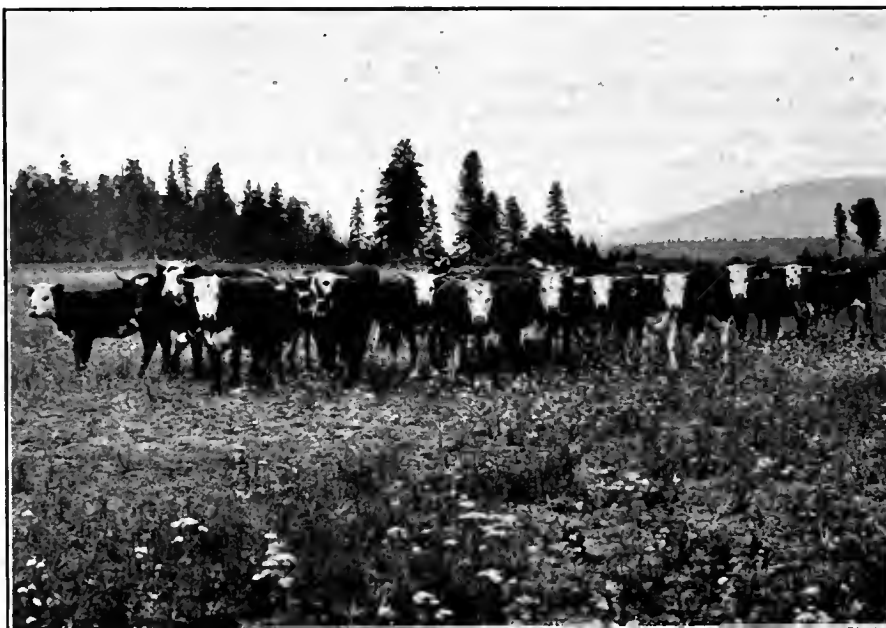
The district is obligated to install and maintain a modern set of books of account, and also to keep an accurate record of all crops raised on the lands of the district. The United States is to take, from time to time, a crop census covering the district lands. This, of course, is for the purpose of checking the data furnished by the district, as well as for securing the information necessary to enable the Secretary of the Interior to determine the per acre construction charge applicable to the land of the district.

The United States is empowered, in case of a breach of any of the terms and conditions of the contract by the district, to terminate the contract upon one year's notice to the district.

### WATER DENIED TO DELINQUENTS

A very important provision of the contract is that prohibiting the delivery of water to any tract of land in the district, when the owner is in arrears more than one year in the payment of any operation and maintenance or construction charge.

Ordinarily land belonging to the United States is not taxable by an irrigation



Hereford cattle on the Klamath project, Oregon-California



district organized under State law, but in 1916 Congress passed a statute known as the Smith Act (act of August 11, 1916, 39 Stat. 506) permitting irrigation districts, with the consent of the Secretary of the Interior, and after compliance with certain conditions, to levy valid assessments upon Federal land within an irrigation district. The contract now under consideration contains an article by which this act of Congress is made applicable to the lands of the United States within the West Extension irrigation district, a copy of the list of lands so affected being attached to the contract as Exhibit A.

A contract of the same general tenor as that above outlined is pending, and probably will be entered into at an early date between the United States and the Hermiston irrigation district. The Hermiston irrigation district contract has now been confirmed by the courts of Oregon, and the execution of the contract is only awaiting the checking by the General Land Office of the list of public lands to be attached to the contract as Exhibit A.

## Potato Records Broken by California Growers

Delta lands near Stockton, Calif., recently shattered their own world's record in potato yields. A yield of 61,420 pounds of potatoes was officially recorded from the Henning tract of the Zuckerman Bros. Three acres produced more than 60,000 pounds each.

This season the Zuckerman Bros. planted 1,500 acres of potatoes, producing 375,000 sacks of potatoes, making an average yield of 250 sacks per acre of No. 1 potatoes and 25 sacks of No. 2. They see no reason why they should not produce 350 sacks to the acre on the entire area of 1,500 acres, and are planning to do this next year.

## Notes From Our Projects 10 Years Ago

*From the Reclamation Record of November, 1916*

**P**ICKING of cotton continued on the Salt River project, but there was a dearth of pickers. At the end of the month some long staple seed cotton sold at  $8\frac{1}{2}$  cents and lint cotton at  $30\frac{1}{2}$  cents. This is the highest price on record, and as the outlook is for an unusually heavy production per acre this should prove to be a banner year for the cotton industry on the project.

A meeting of the Indian reservation water users was held at the Bard schoolhouse, Yuma project. The project manager conferred with the farmers on the subject of the elimination of unproductive areas. The meeting was successful in bringing about a feeling of harmony as to the efforts of the service in making recommendations which would correlate the present unproductive-land problem with the necessity of further drainage work and the payment therefor.

At the Grand River dam, Grand Valley project, the work of installing the power plant and operating equipment was continued. Delivery of one chain shaft was made by the contractor.

Embankment construction at Shermans Lakes dam, Milk River project, was in progress throughout the month, using material excavated from the spillway cut and borrow pit. The trimming of excavation and digging, by hand, of cut-off trenches preparatory to running concrete in the spillway crest was practically completed.

A great many of the farmers on the Uncompahgre project are raking and burning potato vines and weeds, which will do much toward keeping their land free of disease and weeds in the future. They are also planning to bring in several carloads of dairy stock this fall.

Sufficient acreage has been signed up by farmers on the Newlands project for the raising of beets to insure the operation of the local sugar factory during the 1917 season. The factory has been inactive since 1914.

The cotton crop is being picked and ginned. About 60 bales were ginned during the latter part of the month. The lint is of extra good quality and it is believed that its yield will be good, although boll worms have done considerable damage in many fields. A new cotton gin has been erected at Otis and is in operation.

The acreage on the Rio Grande project required by the sugar company for growing sugar beets next year has all been signed and the company agrees to take the beets at the nearest railroad point and to pay a flat rate of \$5 per ton for them. The first Sugar-beet Day was celebrated at Las Cruces on September 20, with a large crowd of farmers in attendance. Speeches were made by representatives of the sugar company, agriculturists, and others, and considerable enthusiasm was manifested.



Progress of construction at American Falls dam, Idaho

## Riverton Crops Win First Prizes

*W. T. Peyton, gatekeeper at Wind River diversion dam, shows the way*

**W.** T. PEYTON is gatekeeper at the Wind River diversion dam on the Riverton project, Wyoming, where 20 farm units were opened to entry in the spring. He has had considerable experience in farming and gardening under irrigation and is enthusiastic about that line of work. In March, 1926, he broke up about 4 acres under the Wyoming Canal just below the diversion dam for a garden. He used no fertilizer. His regular duties as gatekeeper were rather strenuous, as they included ditch riding and a good deal of maintenance and betterment work, so that his time for gardening was limited. In addition to his garden work, he set out and is carefully attending a large number of trees, shrubbery, bushes, and plants. The Wyoming State Highway to the southern entrance of the Yellowstone Park runs past this tract and in a few years, after the trees and bushes have grown to a more conspicuous size, Mr. Peyton hopes to have this plot developed so that it will be a splendid advertisement for the Riverton project.

The first of a new series of Fremont County fairs was held at Riverton recently. This came at a time when Mr. Peyton was unusually busy with maintenance work. He rather hastily got together an exhibit of potatoes and vegetables for the fair. In competition with land that has been farmed for three to forty years, Mr. Peyton took the following prizes:

*First.*—Irish Cobbler potatoes, summer squash, celery, table peas, green peppers, Great Northern beans.

*Second.*—Potato display, Russet Burbank potatoes, cucumbers, turnips, cauliflower, rhubarb, pinto beans.

*Third.*—Crooked neck squash, pickling cucumbers, Swiss chard, beets, string beans.

In addition he had excellent melons, table beets, cabbage, onions, and corn.

Joe Goodwin, a laborer living at Pavilion, had an exhibit from his garden patch which made a very creditable showing considering his entire lack of experience in farming under irrigation.

## Yakima Valley Will Ship 50,000 Carloads

Dean Guic, writing in the *Yakima Valley Progress*, estimates that 50,000 carloads of agricultural and other products will be shipped from the Yakima Valley to national and foreign markets by the end of the 1926-27 season. This enormous production should bring an estimated gross return of more than \$40,000,000.

Apples will constitute the largest tonnage, and it is estimated that between 15,000 and 16,000 cars of the fruit will be marketed. On the basis of \$1.15 a box to the grower, the producers will be paid between \$13,000,000 and \$14,000,000 for this crop alone. Pears, peaches, potatoes, hops, sheep, and hogs will make up the other large shipments.

The best way for a man of moderate means to establish a high producing herd of dairy cattle is to start with a small number of cows and use good purebred bulls.



Threshing grain in the Kittitas Valley

# NEW RECLAMATION ERA

VOL. 17

DECEMBER, 1926

NO. 12



THIS BEET SUGAR FACTORY ON THE LOWER YELLOWSTONE PROJECT HAS A DAILY CAPACITY OF 1,200 TONS

*The*  
**PROGRESSIVE PROJECT**  
**FARMER**

*What He Is—*

*Patient when patience is desirable*  
*Peaceful and pleasant in all classes of company*  
*Peer in his special field of farm work*  
*Persistent and persevering*  
*Powerful in perception but not repugnant*  
*Pleasing in personality*  
*Philanthropic and benevolent*  
*Pioneering toward educational advancement*  
*Plain, clear, and simple in his habits of daily life*  
*Playful, but plucky and progressive*  
*Popular, but positive and dependable*  
*Prompt in the payment of personal dues*  
*Picking each day the proper path toward permanent progress*  
*Proclaiming silently his purpose to push to the front*  
*Prosperous, but also positive in promoting public welfare*

*What He Is Not—*

*Passive concerning perplexing questions*  
*Pessimistic concerning a doubtful future*  
*Pest-like with his associates*  
*Petrified in his thoughts and habits*  
*Pilferous or petty with the precious rights of others*  
*Plundering the property of his neighbors*  
*Petting himself in his own mistakes*  
*Pompous about his accomplishments*  
*Procrastinating the attack of hard work*  
*Pouting or pow-wow-ing about his misfortunes*  
*Prematurely demanding high prices for inferior products*  
*Pretending to be what he is not*  
*Preying on the rights of the weak or the humble*  
*Prodigal or wasteful of his money, his time, or his personal energies*  
*Profane or irreverent to his God*

—PROF. O. W. ISRAELSEN

*Utah Agricultural College*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 17

DECEMBER, 1926

No. 12

## *Interesting High Lights on the Reclamation Projects*

**T**HE Lower Yellowstone project furnishes an example of the returns possible from specialized agriculture. Robert Flynn, of Fairview, produced \$800 worth of cabbages on  $1\frac{1}{4}$  acres, or at the rate of \$600 per acre.

**T**HE Fallon Sugar Company took title recently to the sugar factory at Fallon, Newlands project. Contracts are being signed for beet acreage, and it is reported that the factory will be in operation in 1927.

**A**COTTON growers' association has been formed on the Rio Grande project to handle cotton sales and assist in financing the crop. There has also been considerable discussion of the organization of a project marketing association for fruits and farm products generally.

**O**N the Belle Fourche project the sugar-beet yield will average about 14 tons per acre. Some yields above 20 tons were reported, and a number of growers produced 18 tons. At the prevailing price of \$8 per ton the returns per acre will probably exceed all former production.

**T**HE Colorado Agricultural College, through its extension department, is conducting a series of experiments on one of the farms on the Uncompahgre project in connection with sheep feeding. Various methods of feeding and various kinds of feed are being used to determine the best practice to be followed.

**H**UNTLEY project sugar-beet growers are wearing the smile that won't come off. Excellent weather and labor conditions made it possible to harvest the crop in a very short time. Yields were invariably excellent. Several growers in the vicinity of Ballantine reported a total yield of more than 1,000 tons.

**S**UGAR-BEET growers on the Milk River project are also smiling. On the Malta division several fields yielded in excess of 15 tons per acre. The maximum reported from a field on the Chinook division yielding 26 tons per acre. The sugar content averages about 16 per cent. A considerable increase in the acreage of beets is anticipated for next season.

**P**RELIMINARY reports on sugar beets grown on the Sun River project show yields of about 12 tons per acre with a high-sugar content, which will probably result in a price better than \$7 per ton for the growers. As a result of favorable crop condition and prices, there is a much better feeling existing among the farmers on both the Fort Shaw and Greenfields divisions.

**T**HE apple yield on the Yakima project appears to be the largest in the history of the project. At the end of October practically the entire crop was under cover, with all warehouses packed to capacity. Shipments of apples from the valley to October 31 exceeded those to the same date last year by 2,359 cars. Shipments of fruit from the valley this year totaled 12,691 cars and of vegetables 4,175 cars, or 1,122 cars more than were shipped up to the same date last year.

**T**HE Powell creamery, Shoshone project, purchased 10,500 pounds of butterfat during October, manufacturing 13,000 pounds of butter and 175 gallons of ice cream. Other agencies purchased 3,000 pounds of butterfat. About 5,300 pounds of cream were shipped from the Frannie division.

**D**URING October 341 carloads of agricultural products were shipped from the Yuma project, valued at \$490,600, bringing the total since the first of the year to 2,669 carloads, valued at \$2,630,600.

**W**ORK at Stony Gorge Dam, Orland project, consisted chiefly of clearing brush from the dam site, excavating test pits in the gravel deposits from which aggregates for the concrete for the dam will be obtained, and in cross sectioning.

**T**HE board of directors of the Orland Unit Water Users' Association recently levied an assessment, due November 30, of \$5.20 per acre, \$3.30 of which is for the current year's installment of the building charge, \$1.60 for the 1926 operation and maintenance charge, and 30 cents for association operating expenses.

**T**HROUGH the cooperation of the Forest Service information has been furnished to sheep and cattle men concerning the pasturage and feeding possibilities of lands on the Grand Valley project and considerable interest has been aroused. It is believed that this practice can be built up to a point which will furnish a considerable market for forage and also yield a return to the water users for pasturage and other products not otherwise marketable.

**O**NE way in which the fruit shippers of the Yakima Valley helped to celebrate National Apple Week was to ship two cars of extra fancy apples to charitable institutions in Washington, D. C., and New York City.

**A**T American Falls Dam nearly 21,000 cubic yards of earth fill were placed in the left embankment, and a large amount of rock fill and riprap was placed on both the upper and lower faces of the right embankment. All radial gates and hoists were installed. Cleaning and spraying of the face of the dam were continued. At the end of the month about 25,000 acre-feet of storage had accumulated in the reservoir.



## President Coolidge Approves Vale (Oregon) Project Construction

*The Secretary of the Interior concludes that the project is feasible from an engineering and economic standpoint, based on searching investigation of water supply, engineering features, cost of construction, land prices, and probable cost of development*

**P**RESIDENT COOLIDGE on October 21, 1926, approved the construction of the Vale irrigation project in Oregon, as submitted to him in the following letter from the Secretary of the Interior:

THE SECRETARY  
OF THE INTERIOR,

Washington, D. C., October 20, 1926.

THE PRESIDENT,  
The White House.

MY DEAR MR. PRESIDENT: Section 4 of the act of June 25, 1910 (36 Stat. 835), provides in effect that after the date of that act no irrigation project to be constructed under the act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto shall be undertaken unless and until the project shall have been recommended by the Secretary of the Interior and approved by the direct order of the President.

Subsection B, section 4, act of December 5, 1924 (43 Stat. 701), provides as follows:

That no new project or new division of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

The various features requiring investigation and report under this subsection will be discussed in connection with the Vale project in Oregon in the order in which there presented, as follows:

### WATER SUPPLY

*Source.*—Warm Springs Reservoir of the Warm Springs irrigation district on the Malheur River. The water and storage rights necessary for the development of the project would be purchased at cost from the Warm Springs irrigation district. A portion of the purchase price for storage, \$150,000 to \$200,000, is to be expended in the construction of a drainage system for the Warm Springs irrigation district. This district is at present in serious financial difficulties, due mostly to the development of seepage, which has not been remedied because of a lack of finances.

*Shortages.*—Past records indicate that with the storage now available shortages

will occur in the drier years. Provision has been made in the contract for sufficient funds to provide additional storage by raising the Warm Springs Dam should these shortages prove serious.

*Storage capacity.*—The Warm Springs Reservoir has a normal capacity of 170,000 acre-feet. By the installation of crest control gates the reservoir surface may be raised 4 feet, thus providing additional capacity which may be utilized as hold-over storage. This would give a total reservoir capacity of 190,000 acre-feet.

### ENGINEERING FEATURES

*Storage.*—Addition of crest control gates to present dam at Warm Springs Reservoir.

*Diversion.*—A diversion weir about 12 feet high and 150 feet long will be required on the Malheur River. Location will be about 1 mile west of Namorf station on the Oregon Short Line (Ontario-Crane branch).

*Main canal.*—Located on north side of river for 1 mile. Near Namorf station the canal crosses the river by a steel flume on a steel bridge. It then parallels the river for 4 miles and again crosses the river by a circular concrete siphon. At two intermediate points steel flumes would be required. On the remainder of the canal line within the canyon there would be 9,715 feet of concrete bench flume.

*Power and pumping plants.*—On the Harper division a pumping plant is planned to provide water for about 2,000 acres, power being secured by dropping water back to the river.

*Drainage.*—Bench lands have comparatively good natural drainage, with frequent watercourses for removing waste water. Following irrigation a moderate amount of drainage will be needed.

### COST OF CONSTRUCTION, BY FEATURES

Storage.....	\$690, 000
Main canal.....	2, 500, 000
Laterals.....	280, 000
Drainage.....	120, 000
Total.....	3, 590, 000

### LAND PRICES AND PROBABLE COST OF DEVELOPMENT

The project lands have been appraised by a board of three members, one appointed by the department, another by

the district, and the third selected by these two. Their report, approved by me, establishes an average value of \$11 per acre for the irrigable land, without improvements. Land too high in elevation to be irrigated, or of uneven surface, was appraised as low as \$1.25 an acre. Contracts will be made with the land-owners for sales to settlers at not to exceed these prices to prevent speculation. Nearly 40 per cent of the project lands are owned by two companies. About 15 per cent of the lands are still held by the Government and would be allotted to selected settlers.

### FINDING REGARDING FEASIBILITY OF PROJECT

The foregoing data justify the conclusion that the project is feasible from an engineering and economic standpoint, and I accordingly so find and declare.

### ADAPTABILITY OF LAND TO SETTLEMENT AND FARM HOMES

The Vale project is based on the purchase of one-half the Warm Springs Reservoir. This enables 32,000 acres in the Warm Springs district to be reclaimed through drainage and will enable the 500 settlers who have farms in this district to resume their profitable cultivation. The stored water which is to be purchased is to be used to irrigate land in the vicinity of Harper and Vale, Oreg., by a canal diverting from the Malheur River about 10 miles above Harper and paralleling the Malheur River and Willow creek to Jamieson, Oreg. It will supply water to 28,350 acres classed as susceptible of profitable cultivation under irrigation. About 2,400 acres in the vicinity of Jamieson and 400 acres near Harper now receiving an inadequate water supply are included in the project. The average construction cost is about \$125 an acre.

The climate and soils of the project are adapted to the production of all temperate-zone crops and fruits with yields equal to those obtained on the Boise project. The main crops that can be profitably grown under irrigation are alfalfa, the small grains, Indian corn, red clover, potatoes, and many others of minor importance. Topography is generally excellent. A soil survey by the Bureau of Soils indicates deep and fertile soils over the greater part of the project. A detailed classification of the land on the

basis of three classes of profitably productive land indicates one-half of all the land to be of the first class and the balance divided between second and third class. Branch lines of the Union Pacific Railroad are at a maximum distance of 4 miles from the irrigable land. The town of Vale, county seat of Malheur County, Oreg., especially will benefit by the construction of this project, and several smaller communities will grow and profit thereby.

The 28,350 acres requiring a full water supply is in its natural state adapted only to grazing stock and even then only for a short period in each year, due entirely to low rainfall in that region. Dry farming has been tried but failed. With an ample water supply for irrigation this area will sustain a highly intensified agriculture and make homes for from 400 to 500 additional families. In addition to this it will rehabilitate the Warm Springs irrigation district, having an irrigable area of about 32,000 acres, thus saving the investments already made by many American farmers therein.

#### PROBABLE RETURN TO RECLAMATION FUND OF COST OF CONSTRUCTION

The next declaration required is that the cost of construction will probably be returned to the reclamation fund. This

is interpreted to mean that it will be returned within the period fixed in the contract with the Vale, Oregon, irrigation district, which is in 40 years from the time the public notice that the works are completed is issued by the Secretary.

The average construction cost is estimated at about \$125 an acre, making the yearly construction payment about \$3.10 an acre. The estimated yearly crop income is \$37.50 an acre. It would seem that this would enable construction and operating costs to be paid without hardship to the settlers.

Some of the causes of delinquencies in repayment which have occurred on existing projects will be averted on the Vale project. One is the injurious effect of land speculation, which will be prevented by requiring the large private landholdings to be subdivided and sold to settlers at a fair price. Provision will be made for giving the farmers practical advice in farm development and in working out a crop program. Settlers on the public lands of the Vale project will be selected, as provided in recent legislation. Such selection is destined to be an important factor in the development and solvency of future projects. It is recognized that the feasibility of reclamation depends on securing suitable settlers. This fundamental requirement for the success of Federal reclamation has been stressed

by this department during the past two years. It is a vital element in all calculations and forecasts.

Settlers will begin the farm development of this project under the following favorable conditions: Increase in agricultural production in the Nation is not keeping pace with increase in population. They will realize at the outset that their farms must be intensively cultivated and will be helped to organize for cooperation in production and marketing.

The favorable conditions heretofore recited and the newly established policy of the bureau justify the belief that this project will return the cost thereof.

Because this is regarded as one of the projects best suited to the needs of settlers and appropriate for development under the reclamation law, I recommend its approval and the issuance of the necessary authority to this Department to make contracts for its construction, and to proceed with the work.

Very truly yours,

HUBERT WORK.

Approved October 21, 1926.

CALVIN COOLIDGE,

President.

It takes from 20 to 30 per cent more feed to produce a quart of milk from poor cows than it does from good cows.



Cutting alfalfa in the Milk River Valley, Montana

## Contract Between the United States and the Truckee-Carson Irrigation District

*Providing for the transfer of the management of the irrigation works of the Newlands project, Nevada, to the district and for the repayment of construction charges by the district*

THE Secretary has recently approved a form of contract to be entered into with the Truckee-Carson irrigation district for the transfer of the management of the irrigation works of the Newlands project, Nevada, to the district and for the repayment of construction charges by the district.

The district comprises about 78,000 acres of irrigable lands of the Newlands project, about 44,000 of which are under water-right application, about 20,000 acres of which have vested water rights by reason of irrigation antedating the inception of the project and the remainder not being under water-right application.

The owners of land under water-right application are to have the option either

to continue on the basis of payments fixed in their existing contracts, or to modify such contracts so as to be permitted to complete their payments within a longer period of time, as permitted by the act of Congress of May 25, 1926 (44 Stat. 636).

The contract is to transfer to the district the custody of the entire project, including Lahontan and Tahoe reservoirs and the lands withdrawn or purchased in connection with the reservoirs. The district is to agree to care for and operate the project in a careful manner and in such away that the transferred works shall remain in as good and efficient condition for the development, diversion, and distribution of irrigation water and for the

development of power as is the case at the time the works are turned over to the district.

All those water users who desire an extension of time within which they may pay charges that are delinquent at the date of the contract are to make application for such privilege. Delinquent construction charges so extended are to be payable within 15 years, with interest at the rate of 6 per cent per annum. Delinquent operation and maintenance charges when extended are to be payable within 5 years, with interest at the rate of 6 per cent per annum.

In the contract the district is to assume the payment of the construction cost of the project, as reduced by the adjustment act of May 25, 1926 (44 Stat. 636). The district is to act as fiscal agent of the United States for the collection of construction charges from the owners of lands under water-right application who do not consent to amend their applications to conform to the proposed district contract.

The period of time within which the construction charges not due at the date of the contract may be paid is fixed in the contract in the following language:

"(a) Each consenting application landowner, the first payment on whose contract matured on or before December 31, 1916, may complete the payment of his accrued and unpaid construction charges in equal semiannual installments within 40 years from the date of the first payment which matured under his application.

"(b) Each consenting application landowner and each nonapplication landowner, the first payment of whose construction charge matured or matures later than December 31, 1916, and prior to January 1, 1937, may complete the payment of his construction charges in equal semiannual installments, the last of which shall be payable not later than July 15, 1957.

"All owners of nonapplication lands and/or of application lands, the first payment of the construction charges on which may mature subsequent to January 1, 1937, must complete the payment of their construction charges in such number of installments, of such amount per installment per irrigable acre, and on such due dates from the district as may be hereafter fixed by the Secretary."

The form of contract provides for the payment of interest at the rate of 6 per



Just spuds, but the kind that mean money to the grower

cent per annum from the due date to the date of payment upon all charges which are not paid when due.

The operation and maintenance equipment owned by the United States at the time that the district takes over the project is to be turned over to the district so far as desired by the district board of directors. The district is to make payment therefor in 15 equal annual installments.

In order that the Government may know that its investment in the project is protected, the manager employed by the district after the project is taken over by the district is to be and remain satisfactory to the Secretary of the Interior during the period preceding full, payment of the construction charges.

The district is to keep a careful record of its financial and other transactions and this record is to be accessible to the employees of the United States. The Secretary may also cause to be made from time to time an inspection of the transferred property, and the district is to bear the cost of such inspections.

The district, as required by State law will apportion the benefits of the contract to the various tracts of land in the district, and after the confirmation by the court of such apportionment the liens reserved to the United States in the patents issued under the reclamation laws will be released, under the provisions of section 2 of the act of Congress of May 15, 1922 (42 Stat. 541), as to consenting application land.

Article 24 of the proposed contract provides for joint liability, and on account of its importance, is quoted below in full:

#### **CHARGES A GENERAL OBLIGATION OF THE DISTRICT**

"The district is obligated to pay to the United States the full amounts herein agreed upon according to the terms stated regardless of individual default in the payment of any assessment levied by the district, but it is understood and agreed that when construction assessments on any tract of land in the district have been paid in an aggregate amount equal to the full amount of such land's construction charges and of all the items mentioned in this agreement, such tract of land (hereinafter referred to as paid-up land) shall thereafter be liable for construction assessments for the purpose of meeting the obligations of the district under this contract only in the event that the district is delinquent in its payment to the United States, and/or only to the extent that assessments are levied to meet estimated or existing delinquencies in the payment of charges, and may be assessed at a lesser rate than the rate applicable

to lands of similar class which are not paid up in full, if such lesser rate, together with the district's other collections are sufficient to meet the district's obligations, or estimated obligations to the United States, and in the event of such delinquencies on the part of the district and/or the collections of construction assessments from such paid-up lands it shall be the duty of the district to refund to the owners of such paid-up lands the construction assessments collected therefrom in excess of the total construction charge pertaining

### **Riverton Project Offers Opportunity**

*Opening to entry of 40 farm units of public land on the Pavillion division of the Riverton irrigation project in Wyoming, for which water will be available in the irrigation season of 1927, was announced recently at the Interior Department.*

*The farm units range in size from an irrigable area of 25 acres up to 112 acres. The farm units were originally a part of the Wind River, or Shoshone Indian Reservation, and in addition to the reclamation charges entrymen must pay \$1.50 per acre at the local land office in Lander, Wyo. An initial payment of 50 cents per acre must be made at the time of entry and 25 cents per acre each year for four succeeding years.*

*Applicants for the farm units must also qualify before the Riverton Examining Board as to industry, experience, character, and capital, and must have had at least two years' actual experience in farm work and practice. In addition, each applicant must have at least \$2,000 in money free of liability or its equivalent in livestock, farming equipment, or other assets.*

*Ex-service men of the World War have a preference right of entry until March 3, 1927, provided that they are qualified to make entry under the homestead laws. As the construction charges for the Riverton project have not yet been fixed, irrigation water will be furnished to settlers on these farm units during the irrigation season of 1927 and 1928 at, 1 per acre for each irrigable acre of land in the farm unit, which will entitle the entryman to 2 acre-feet of water per acre for each of the irrigation seasons. Additional water will be furnished at the rate of 50 cents per acre-foot.*

thereto, or so much of said excess as can be paid out of the funds available as soon as there are sufficient funds available in the treasury of the district, and not required to pay the district's obligations to the United States, either under this agreement or other agreement or agreements, or the cost of the operation and maintenance of the transferred works, and the maintenance of the district organization."

The United States is to expend the maximum sum of \$150,000 in repairing Derby Diversion Dam and in the enlargement of Truckee Canal. The district is to make payment to the United States in 30 years of the amount expended by the United States in such repair and enlargement work.

The execution of the contract is to be authorized by the electors of the district and confirmed by the courts. This will enable the court to investigate judicially any alleged irregularity connected with the proceedings and to determine in advance if such is the case and the proceedings were regular and the contract valid.

### **George Strohm Grows Record Late Potatoes**

For many years the idea has prevailed that the soils of the Umatilla project, Oregon, were not well adapted to the growing of late potatoes. Last year George Strohm, one of the successful water users on the project, did very well with a small patch of late potatoes, but many believed it was more or less luck.

This year, in order to prove that he could really grow potatoes, Mr. Strohm planted 1.4 acres to Netted Gems. He dug 59,534 pounds of marketable potatoes, which he sold for \$1,041.85, or at the rate of \$1.75 per hundred. A yield of 709 bushels per acre is considered remarkable for the project.

Early potatoes are grown on the project with success and some profit, and if there are, as there seem to be, soil adapted to growing late potatoes, production should be encouraged. They would provide an increase in the farmers' income, even though large acreages were not planted to the crop.

The extra yield due to the practice of crop rotation is a profit that may be credited to the managerial ability of the farmer.

Cultivation aids both rotation and fertilization; rotation aids in rendering fertilizers more effective; and fertilizers increase the value of rotation.





## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor,  
New Reclamation Era



### Holiday Spirit

WHO doesn't look forward to Christmas Day of all the days of the year? The spirit of the season grips one long before the cherished day arrives. Each and every one of us is thinking of some pleasure we can make for those near and dear to us and for those who have no one to think of them. Home ties are strengthened and we feel happiest when we have made those around us happy.

Like Thanksgiving Day, many a farm home will be the setting for homecomings and family reunions. This is where the housewife plays her most important rôle, and in the hope of being helpful in planning your holiday menus, the following suggestions are given of making the same food you have been preparing during the year a little differently.

Sweet potatoes may be substituted for white potatoes in the make-up of the menu. They have much the same food values as white potatoes, but contain a somewhat larger percentage of sugar and have a higher caloric value.

The general methods of cooking sweet potatoes—baking, boiling, and frying—may be varied almost endlessly by combinations with different seasoning or with other foods. In the North sweet potatoes are for the most part cooked rather simply, while in the South, where the supply is more abundant, they often are candied with various sirups and flavorings and used in making bread, cake, pie, and pudding.

The different ways of frying are just as successful with sweet as with Irish potatoes. Cut into strips, lattices, or chips the raw potatoes may be fried crisp and brown in deep fat; left-over boiled or baked ones may be sliced and sautéed, or they may be mashed, formed into cakes or balls, or mixed with egg for croquettes and fried.

#### HAM SMOTHERED IN SWEET POTATOES

1 slice smoked ham cut into sizes for serving.	1 tablespoon butter or ham fryings.
3 cups raw sliced sweet potatoes.	2 tablespoons sugar.
	1 cup hot water.

Broil the pieces of ham lightly on both sides and arrange them to cover the bottom of the baking dish. Spread the sliced sweet potatoes over them and sprinkle with sugar. Add the hot water and extra fat. Cover the dish and bake slowly until the ham is tender, basting the potatoes occasionally with the gravy. Brown the top well.

#### SWEET POTATO PIE

1½ cups boiled rice	1½ cups milk.
sweet potatoes.	¼ teaspoon ginger.
2 tablespoons butter.	½ teaspoon salt.
¼ cup sugar.	2 eggs.

Mix the above ingredients in the order given and bake in one crust.

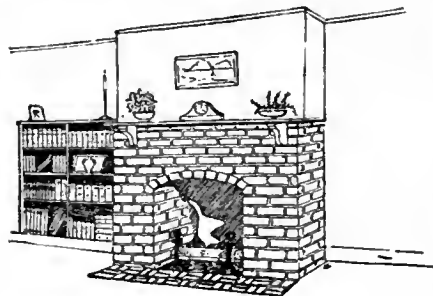
#### SWEET POTATO PUFF WITH MARSHMALLOWS

To 2 cups of hot rice sweet potatoes add 3 tablespoons of butter, ¼ teaspoon salt, pepper to taste, and ½ cup of hot milk. Beat the mixture well. Then beat 2 eggs separately, add yolks to the potato mixture, cut and fold in the stiffly beaten whites. Place the mixture in a buttered baking dish and place a layer of marshmallows close together over the top and brown in a slow oven.

#### SWEET POTATOES WITH APPLES

3 sweet potatoes.	3 tablespoons butter.
4 apples.	Cold water.
¼ cup sugar.	

Wash and cook the sweet potatoes in skins. Cook them for 15 minutes in boiling salted water. Cut the potatoes and apples in slices, place them in alternate layers in a buttered baking dish, and sprinkle sugar over each layer. Add a little water and bake until the apples and potatoes are soft.



### Chicken Rizotto

From the Italians comes the suggestion for a rice and chicken dish which is both savory and economical. In fact, it is an excellent way of extending the flavor of a small quantity of left-over chicken into a substantial dish for another meal. The carcass of a cold roast fowl or bony pieces left from the first serving of chicken fricassee can be used in this way.

Pick the meat from the bones of the left-over chicken and stew the bones in enough water to make a quart of broth, adding any left-over gravy or sauce that will furnish chicken flavor. In a large skillet cook slowly in two tablespoons of butter an onion which has been minced finely, but do not let the onion brown. To this add the quart of chicken broth, and when it boils up rapidly sprinkle in

slowly three-fourths of a cup of rice which has been washed free of surface starch. Cover the skillet, and allow the rice to simmer in the broth for about 25 minutes, or until the grains swell and become soft. Shake the skillet from time to time to keep the rice from sticking, but do not stir it unless absolutely necessary. By the time the rice is done it will have absorbed practically all the broth and the grains will be large and separate. Then add the small pieces of chicken which were picked from the bones, turn the mixture onto a platter, and sprinkle it generously with grated cheese. The Italians use Parmesan cheese, but any of the American varieties hard enough to grate will be satisfactory. Mushrooms, either fresh or canned, are also an excellent addition. This is bound to appeal to American palates.

### Fireside Entertainment for Grown-ups and Young

#### POP CORN

Hand poppers are inexpensive and; if the man of the house is handy, may be made at little or no cost and with very little effort.

For good results in popping, the main requisites are good corn and a hot fire. In popping, certain precautions may be observed to advantage.

Do not take too much pop corn at one time, not more than enough to barely cover the bottom of the popper one kernel deep. Hold the popper high enough above the fire or heat to keep from burning the kernels or scorching them too quickly. The right degree of heat for best results in popping should make good corn begin to pop in 1½ minutes. This should give the maximum volume increase in popping. If it begins to pop in less time or if a large quantity of corn is put into the popper, it will not pop so crisp and flaky. If it takes much longer for the popping to begin, the heat is probably not great enough or the pop corn is of poor quality, or there may be other interfering causes, such as drafts of cold air.

To preserve the snowy whiteness of the popped kernels, the flame should be kept from striking them. This can be done by placing a plate of iron or a stove lid



between the corn and the fire if a wire popper is used or by using a pan popper if popping directly over a flame.

If the pop corn is in first-class condition and the heat properly applied, 1 pint of unpopped corn should give 15 to 20 pints of popped corn.

### HOME USES

Pop corn usually is popped to be eaten at once, or it may be made into pop-corn balls, crackajack, or other forms of pop-corn confection, some good recipes for which follow. A common way of preparing it is by popping and sprinkling it with salt or adding salt and melted butter.

#### CHOCOLATE POP CORN

2 teacupfuls of white sugar. 2 ounces of chocolate.  
 $\frac{1}{2}$  cup of corn sirup. 1 cup of water.

Put these ingredients into a kettle and cook them until the sirup hardens, when put in cold water. Pour over 4 quarts of crisp, freshly popped corn and stir well to insure the uniform coating of the kernels.

#### SUGARED POP CORN

Make a sirup by boiling together 2 teacupfuls of granulated sugar and 1 teacup of water. Boil until the sirup strings from the spoon or hardens when dropped in cold water. Pour over 6 quarts of freshly popped corn and stir well.

#### POP-CORN BALLS

1 pint of sirup. 2 tablespoonfuls butter.  
 1 pint of sugar. 1 teaspoonful vinegar.

Cook till the sirup hardens when dropped into cold water. Remove to back of stove and add  $\frac{1}{2}$  teaspoonful of soda dissolved in a tablespoonful of hot water and then pour the hot sirup over 4 quarts of freshly popped corn, stirring till each kernel is well coated, when it can be molded into balls or into any desired form.

## Curtains for the Bedroom

Here are bedroom curtains that combine daintiness and attractive color along with the essential utility features. Sometimes in the desire to gain an artistic effect the usefulness of curtains is overlooked. All points can be combined in attractive durable curtains. Like everything else, it's all in the knowing how.

The curtains in this picture, for instance, let in plenty of light and air. The section shirred on rods and attached to the lower sash gives privacy when needed and goes up with the sash when it is raised at night. The straight gathered valance and the straight side draperies are easy to make and hang, and the fabric is a good quality washable marquisette, white with yellow dots. Even though soot and dust settle, their traces can be quickly washed out and the curtains put up looking as fresh as new.

Notice that the side draperies come to the bottom of the "apron" or board that frames the window casing at the bottom. Also the valance is about one-sixth as long as the draperies.



Attractive corner in a bedroom

These curtains are also in harmony with the other furnishings of the room. Their lines reflect those of the simple painted bookshelves topped with a pair of plain brass candlesticks. The candles are soft yellow to match the dots in the curtain fabric and in other accessories of the room.

## Co-operation!

What a magic expression!  
 Open my breast—  
 There you will find the inscription  
 Right across my heart in letters of crimson  
 Engraved CO-OPERATION.

Hark!  
 You troubled world;

Listen!  
 Gaze across the continent  
 From Louisiana to Montana,  
 From Maine to California;  
 See beacon lights arising,  
 Illuminating a new white way,  
 And from the selfishness and greed of  
 yesterday  
 Mighty hordes of awakened American  
 producers  
 Are ushering in the dawn of a new day.

Producers and consumers together,  
 Marching side by side,  
 Co-operating with one another  
 To rid the world of every parasite.

BENJAMIN BROWN,  
 Director of Sales, Utah Poultry  
 Producers' Cooperative Association,  
 Salt Lake City.

# Irrigation Service Regulations for Rio Grande Project

Approved by Department of Interior, November 11, 1926

**IN general.**—Water is delivered from the Rio Grande Federal irrigation project, pursuant to the provisions of all existing contracts between the United States and the district, of the act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto, and of the regulations of the Department of the Interior promulgated thereunder.

**Execution of application.**—If the application is signed for the owner of the land by some other person, the latter shall immediately furnish evidence satisfactory to the district, of his authority to so execute the application.

**Error in application.**—The use of irrigation water on any land other than that shown in the application is prohibited, and the right is reserved by the United States to withhold service on this application until correct irrigable area is submitted by landowner. Applicant will pay charges to the district on the basis of the correct area.

**Water charges.**—The charges to be paid by the applicant on account of each season, will be announced by the district and will be collected by district levy and assessment, as provided by contract between United States and district.

## APPLICATION FOR AND KIND OF SERVICE

**Water service outside district.**—Owners of lands located outside boundaries of the

irrigation district limits will apply to offices of Bureau of Reclamation at Las Cruces, N. Mex. or El Paso, Tex., for special annual water application for irrigation service and irrigation district offices will refer such application to above offices.

**Classes of service.**—There are two classes of water service, one permanent, the other temporary. Land certified by the United States as subject to the payment of construction charges has a permanent right to the use of water from the project. All other land receives water on a temporary basis. The furnishing of water under this application to land of the latter class shall in no event be construed as a basis for continued delivery or a permanent right, and water may be refused for such lands at the end of any irrigation season.

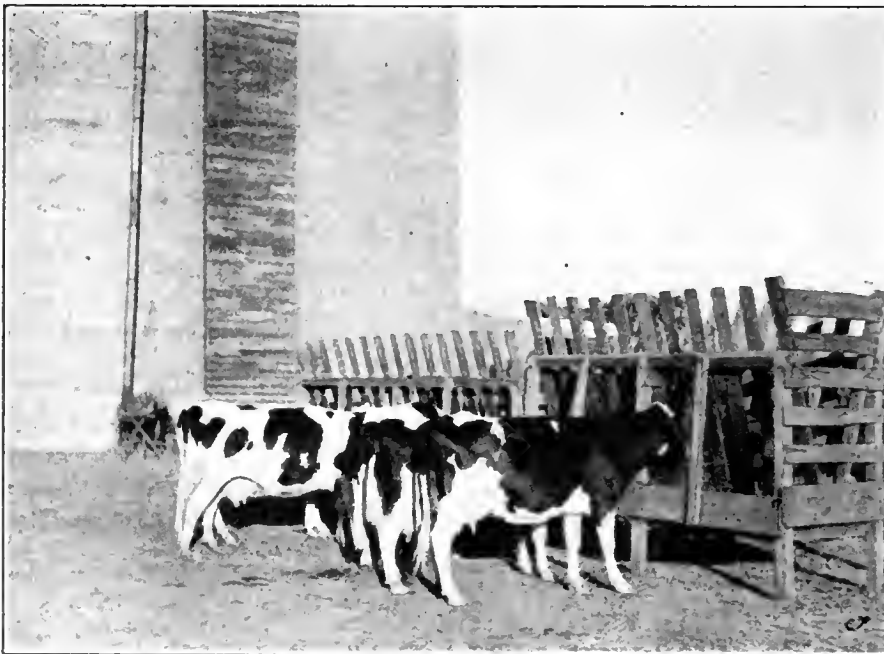
**Ditches to be kept clean.**—The ditches of the applicant shall be kept clean and in good condition by the applicant, and upon failure to meet this requirement the United States may refuse the delivery of water until the condition is corrected to the satisfaction of the superintendent of the project. If a community ditch is not kept clean and in good condition, the United States shall have the right either to so refuse the delivery of water or, at its option, to clean the same and charge the cost thereof against the water users thereunder.

**Government to control irrigation works.**—The United States shall have full control over all ditches, gates, and other structures required to deliver water, and the superintendent of the project shall have the right, in order to secure economical and efficient service, to establish and enforce such rules in connection therewith as he may deem appropriate.

**Operation and maintenance of structures.**—In so far as topographic and practical conditions permit, irrigation water for lands directly served by project canals will be delivered through one turnout, or delivery box, for individual tracts of 40 acres or less, the cost of such service being included in the established minimum charge. Should the use of additional turnouts be desired, a charge covering the cost of operating and maintaining such added structures will be made.

## DELIVERY AND USE OF WATER

**Delivery of water.**—Request for water shall be made in writing or by telephone to the proper employee of the Bureau of Reclamation at least 48 hours in advance. Notwithstanding the fact that advance notice is required, the United States reserves the right to deliver all water under similar applications in the order in which requests are received, or follow a plan of rotation approved by the Superintendent of the project until all orders of a given date have been filled. Water will be delivered at the customary place to be there received by the applicant, and conveyed to his land at his expense. In case water is delivered into a community ditch, the water users of the ditch shall appoint an alcalde or superintendent, who will order the required water. When more than one water user is on a sublaterals or a community ditch, and request is made for irrigation service for all water users thereon, the amount of water delivered will be prorated among all the water users according to the acreage irrigated or on other basis that will insure efficient delivery and equitable charges. The United States reserves the right to deliver all water under similar applications in the order in which requests are received, or follow a plan of rotation approved by the Superintendent of the project. Water may be refused as long as any district assessment or charge against the land described in the application remains delinquent, or upon failure of applicant to observe any of the requirements of these regulations.



Registered Holsteins at the feeding rack, Rio Grande project, New Mexico-Texas

**Improper use of water.**—The water delivered to an applicant shall not be used on land other than that described in the application, nor shall it be permitted to collect or run upon other land or be wasted in any manner. The running of waste or other water into drainage ditches will not be allowed, except by special permit. Whenever an applicant desires to cease irrigating prior to the termination of the period for which he has ordered water or prior to the completion of an irrigation, he shall notify the Government ditch rider that he is about to discontinue the use of water. If in any such case he turns or permits water to be turned back into the source of supply, all water so released will be charged to the applicant the same as if used until discovered and placed elsewhere. Water users are responsible for water after it has been delivered for their land, either at the land or to sublaterals or other portions of the irrigation system operated by them, and for damage to either irrigation or drainage ditches owned by the United States or to adjoining properties and improvements thereon, due to their carelessness in handling water. Damage to property of the United States caused by improper handling of water by the applicant or his employees must be repaired by the applicant at his own expense, and in case of failure the applicant shall be liable to the United States for the amount of damage.

**Water for subdivisions.**—Delivery of irrigation water to all portions of subdivided tracts will be contingent upon submission to the project superintendent of a clear written understanding between purchaser and seller as to the rights and conditions of use of existing canals and laterals in order that no portions will be without facilities for water service.

**Quantity of water.**—The water furnished shall be limited to the quantity which may be used beneficially upon the land described in the application, or such part thereof, to be determined by the superintendent of the project, as shall constitute a proportionate share per acre of the water supply actually available at any time for all of the area being at that time watered from the same source of supply. Water shall be run only during the irrigation season, the limits of which shall be fixed by the boards of directors of the El Paso County water improvement district No. 1 and Elephant Butte irrigation district. In case said boards can not agree the superintendent of the project shall fix the limits.

**Leaching water.**—Water service for the purpose of flooding lands for the dissolution and removal of alkali will be furnished only to lands which have good drainage and which have been properly

prepared by plowing, the construction of borders, and compliance by applicant with such other requirements as may be necessary in the opinion of the Bureau of Reclamation to reclaim the land. The district will issue no contracts for such service until report on conditions is made and approved by Bureau of Reclamation.

#### WATER SHORTAGE AND WASTE

**Shortage of water.**—On account of drought, inaccuracy in distribution, or other cause there may occur at times a shortage in the quantity of water provided for herein, and while the United States will use all reasonable means to guard against such shortages, in no event shall any liability accrue against the United States or the district, their officers, agents, or employees, for any damage, direct or indirect, arising therefrom.

**Waste and seepage water.**—The United States reserves the right to collect for use on said project all waste and seepage water coming from the land described in the application. The applicant releases the United States, its officers, agents, and employees from every claim for damage, direct or indirect, arising by reason of the presence of waste or seepage water on said land.

**Water-delivery statements.**—Statements of the quantity of water delivered shall be furnished by the United States to each applicant. Any applicant who questions the accuracy of any such statement shall within 30 days notify the Government superintendent of irrigation of his claim, which shall thereupon be promptly investigated and proper adjustment made. Unless such notice is given within the prescribed time no claim for adjustment shall be considered.

**Liens.**—A lien in favor of the district for all charges incurred under this application is hereby fixed against the lands described in the application and irrigated by the water so furnished. Said lien may be foreclosed in the manner that other similar liens are foreclosed. This provision is cumulative, and in addition to other remedies now provided by law or otherwise. In case the crop for which water is furnished under this application shall be harvested prior to the time fixed for payment, the entire unpaid amount shall become due and shall be paid within 10 days after the harvesting of such crop and before the removal of the same from the county.

#### “Winning of the West” Meeting in Los Angeles

A “Winning of the West” conference was held recently in Los Angeles at which representatives were present from the States of Washington, Oregon, Utah, Nevada, California, and New Mexico.

The principal topic of discussion was the necessity for cooperation and for a united front in regard to western reclamation matters. The conference favored immediate and united action by the West in support of the Swing-Johnson bill and consequent development of the Colorado River, as it was declared that the success of the Colorado River development economically and financially would stimulate Federal reclamation work in all parts of the West.

The question of a permanent organization was left in the hands of a committee of which Thomas E. Campbell, former Governor of Arizona, was made chairman.



Flour mill on the Lower Yellowstone project with a daily capacity of 500 barrels

# Resolutions Adopted by Sixteenth Annual Oregon Reclamation Congress

Hood River, Oreg., October 16, 1926

**BE it resolved,** That since we have seen from the State engineer's report that 25 of the 29 projects in Oregon are in a hopeful condition, and that 19 of them are meeting their obligations and payments, and that since we believe from the trend of the settler movement and general agricultural interests of the State, that these interests are at the turning point toward success, we express our confidence and declare our faith in the future and essential importance of reclamation in Oregon and in its solid and intrinsic value. We ask for and challenge cooperation of the best minds in this State, and we pledge the best within us to help work out problems of legislation. We recognize the necessity of accurate evaluation of properties in approaching adjustment of the problems of districts in financial straits. We recognize proper methods of cultivation and production in irrigation and marketing methods as outlined in the state-wide and county agricultural conferences of the Oregon Agricultural College, believing that this will be instrumental in assisting the settler to meet his obligations.

Whereas this congress believes that the potential power resources and available electrical supply to the reclamation projects and other interests of Oregon as superior service at rates as low as may be obtained anywhere else on the Pacific coast, and

Whereas our examination does not indicate that the so-called housewives' bill on the November ballot will serve these purposes; be it

**Resolved,** That the Oregon Reclamation Congress disapproves the housewives' bill as inimical to reclamation interests.

It having been brought to the attention of this congress by the press of this State that the Secretary of Interior and Commissioner of Reclamation have approved the feasibility of the Owyhee and Vale Oregon projects, and have recommended to the President of United States the expenditure of appropriations of these projects, and have caused the President to certify the expenditure of the aforesaid appropriations, now be it

**Resolved,** That the Oregon Reclamation Congress here assembled in annual convention does hereby commend and

indorse such action and expresses its belief that the care used by the aforesaid officials in recommending these projects has tended to further the cause of reclamation within the State of Oregon and to restore public confidence in Federal reclamation within this State, and we also urge the Secretary of the Interior to proceed with the construction of other Oregon projects.

The Oregon Reclamation Congress is keenly interested in seeing the arid lands of Oregon brought under irrigation.

The Congress of the United States has several times appropriated money for the building of the Baker project, but as yet work on the same has not been started.

It is the desire of this organization, in annual convention assembled, that work on the Baker project be started at once. And therefore be it

**Further resolved,** That copies of this resolution be sent to the Hon. Hubert Work, Secretary of the Interior, to Hon. Louis C. Crampton, chairman Interior Department Appropriations Committee, to the Oregon delegation in Congress, to the press, and that copy also be spread upon the records of this meeting.

**Resolved,** That the legislative committee present to the next Legislature of the State of Oregon a bill authorizing the State securities commission to enter into contract with the Secretary of the Interior or any irrigation district organized under State law, to assist the Secretary of the Interior or said irrigation districts in promoting the settlement of the projects or divisions after completion, and in the securing and selecting of settlers; the amount of money to be used for purposes of settlement subject to appropriations in future by the legislature.

Whereas the Deschutes project comprises a body of land of approximately 140,000 acres lying in Jefferson, Crook, and Deschutes Counties.

Whereas this has been investigated by both the State and Federal Governments and found feasible.

Whereas the Deschutes project can be constructed at a reasonably low per acre cost, is in close proximity to markets, has

adequate transportation facilities, with a water grade to tide water ports, and the land is all privately owned, and nearly all cleared, and

Whereas it is in the proximity to large timber resources and electrical development: Therefore be it

**Resolved,** That the Oregon Reclamation Congress indorse this project and urge that the Congress of the United States appropriate funds with which to construct it in the very near future.

On October 16, 1926, the irrigation congress at Hood River, Oreg., adopted the following principles of needed legislation to assist in working out the irrigation district situation in Oregon:

1. That the State be not called upon to assume the liabilities of irrigation districts.

2. That the control of all reclamation matters be vested in the State irrigation and drainage securities commission.

3. That provision be made to prevent pyramiding of taxes so that settlers will be protected and the obligations of each limited to a definite fixed sum.

4. That legislative machinery be provided to permit and encourage the pooling of all interests involved on any project wherein default has occurred, to the end that constructive cooperation may be secured.

5. That such amendments be made to our present irrigation district law in the matter of payment of operation and maintenance charges so that the district's officers may have the option of collecting such charges in advance instead of through the county officers, as now provided, and that they have the further option of denying water to the settlers until such charges are paid, provided that such action will not release the land from the lien of operation and maintenance charges once levied.

6. That on any new irrigation district projects which may be undertaken, and on existing projects, as far as possible, assessments should be made in proportion to the benefits to be derived from the water right supplied.

7. That operation and maintenance charges be based upon a fixed charge for the first unit of water supply and an additional charge based on additional quantity of water delivered.

(Continued on page 211)



## Progress in Settlement in Victoria, Australia

**T**HE annual report of the State Rivers and Water Supply Commission of Victoria, Australia, gives interesting facts regarding the progress being made in settling their irrigated land. The following paragraphs are quoted from the report:

The number of successful applicants for irrigation blocks during the year was 195. In addition to this, the extension of storages and supply channels has allowed the settlement of some 300 new settlers in districts newly provided with a domestic and stock supply service. The total in the irrigated areas comprised 13 discharged soldiers, 135 civilians, and 47 approved land seekers from overseas. The lands thrown open for settlement totaled 3,940 acres—3,050 acres from lands held in reserve and the balance, 890 acres, from lands purchased during the year.

The placing of 13 discharged soldiers on irrigation farm blocks practically completes this phase of the commission's work of repatriating discharged soldiers. In other respects, however, the work of repatriation is continuous, the commission having undertaken to furnish the soldier settlers not only with advice in irrigated culture, so as to obtain adequate returns for their labor and financial outlay, but also to continue an adequate system of advances for the purchase of stock and carrying out of permanent improvements to their holdings. Altogether 2,181 discharged soldiers have been placed on irrigable blocks. Of this total, 343 obtained their farms under section 20 of the closer settlement act, as explained in previous reports.

With the extension of the Goulburn Channel system, further areas will be

made available for intending settlers as required. The commission has in hand for this purpose about 30,000 acres of suitable land, purchased before the construction of the works. Included in this total are some 1,300 acres near Kyabram available for immediate occupation and 10,000 acres at Katandra, which will be served by the East Goulburn Channel, the enlargement and extension of which are now in progress; also about 3,300 acres at Calivil, near the Loddon River. The lands in reserve and temporarily leased also include a balance of about 10,000 acres of the irrigable portion of Red Cliffs Soldier Settlement on the River Murray, 3,000 acres at Maffra partly subdivided, and 3,000 acres of lands at Hallam and Narre Warren, which will be made available for settlement as occasion demands and as soon as the progress of the works permits.

### PROGRESS OF IRRIGATED CLOSER SETTLED DISTRICTS

The development of irrigation in all parts of the world is one of slow but sure growth, and although in some countries there has been some slight retrogression on account of the post war slump in markets for agricultural produce, it is gratifying to note that in this country irrigation development has continued to make satisfactory progress.

A striking example of this is noticeable in the Bamawm Closer Settlement Estate in the Rochester district. This estate, which comprises an area of 13,400 acres, was prior to its purchase for closer settlement under irrigation used for cereal growing and sheep raising, and although considered closely settled under dry-farming conditions supported only 21 families. In 1910 this Bamawm area was purchased by the Government and in 1912 subdivided into 180 blocks of an average area of 70 acres. The size of the indi-

vidual holdings varies with the quality of the soil and ranges from a few acres for workmen's holdings to 200 acres for mixed farming, where the soil is not of the best quality. Almost immediately after settlement, and before the settlers had time to establish themselves, they had to face the dry visitation of 1914-15, which caused them heavy losses. The period 1915-1919 had then to be spent by the settlers in consolidating their position by effecting improvements and raising the quality of their herds. During this period it was necessary for the commission to assist the settlers by advances, while at the same time the arrears of installments due increased, reaching a maximum of £25,000 in 1919. As a set-off, however, the settlers' improvements during this period increased from £42,642 in 1916 to £71,600 in 1919, and since then there has been a steady decrease in the amount owing, while further improvements have been made, making a total value of permanent improvements of £140,412. In addition the settlers' stock and implements bring the total value of their assets to over £275,000. The value of the land has likewise increased by at least a further amount of £100,000. Thus today the settlement is in a very satisfactory condition, as the subjoined figures show.

The stages in the progress made by the district from 1910, when it was used mainly for cereal growing and supported 21 families, and now, when it supports 176 families, are shown by taking the progress at two different periods, 1916 and 1925, thus:

	1916	1925
Land—Purchase money due by settlers.....	£127,500	£105,960
Advances—Repayments due by settlers.....	£29,500	£17,568
Value of improvements, stock, implements.....	£72,758	£275,000
Population.....	501	1,182
Citrus groves.....acres.	396	816
Deciduous orchards.....do.	376	624
Lucerne, cereal, and fodder crops.....acres.	6,757	11,020
Cattle.....	769	2,073
Horses.....	550	670
Sheep.....	3,274	6,950
Pigs.....	1,542	8,982
Poultry.....	3,167	24,000

### Resolutions Adopted By

#### Oregon Reclamation Congress

(Continued from page 210)

8. That the foreclosure of delinquent tax certificates follow the form or practice now followed by the county courts in the foreclosure of delinquent general taxes, to the end that the procedure may be simplified and the cost to the irrigation district lessened.

9. That an immigration department be created for the purpose of assisting in the colonization of all projects, the same to be under the direction of the State engineer, an addition to his department.

The above principles were adopted unanimously by the irrigation congress held sitting as a committee of the whole, and the report of the committee was then adopted by the congress in regular session.

## Yakima Orchard Produces Fine Yield

Packing 28,000 boxes of Jonathan apples from the Gilbert Orchard Co. ranch near Harwood, Wash., was completed recently. This tonnage came from 39 acres and represents a yield of 717 boxes an acre. The orchard contains 157 acres, 39 of which are in Jonathans. The owner of the ranch is H. M. Gilbert, president of the Tieton Water Users' Association and one of the successful farmers on the Tieton division of the Yakima project.

It will thus be seen that during the past 10 years there has been a most marked increase in the value of assets with a corresponding decrease in amounts owing, and this improvement should be even more pronounced from this on, as settlers begin to get the full benefit of developed orchards and increasing number of stock.

Other irrigation districts which contain a number of soldier and overseas settlers are progressing along similar lines, but because of their more recent settlement are naturally not yet in the same stage of development as those of the somewhat earlier settlers referred to at Bamawm.

In the United States five settlers applied for and secured farm units on three of our reclamation projects. On some projects no public land is available for entry.



## Columbia Basin Project to be Studied

**I**N a report submitted recently to Secretary of the Interior Work a special committee recommends that the agricultural and economic phases of the proposed Columbia Basin project in eastern Washington be studied by selecting six typical tracts of approximately 5,000 acres each. These tracts are typical of the soil conditions, topography, state of development, and climatic conditions of large areas comprising the Columbia Basin project.

The Columbia Basin consists of about 1,750,000 acres of land susceptible of irrigation from the Pend Oreille and Spokane Rivers in the State of Washington.

This proposed project has been investigated by many engineers and groups of engineers. Homer J. Gault, for many years an engineer in the Bureau of Reclamation, was selected with the approval of the Secretary of the Interior to conduct the field work in 1923. His report was submitted in March, 1924. A board of eminent engineers reviewed this report and submitted their findings in February, 1925. Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, and Hon. John H. Edwards, Assistant Secretary of the Interior, reviewed all the reports and came to the conclusion that further information was needed before undertaking such a gigantic scheme. The selection of these tracts and the study of them that is to follow is the initial step in

obtaining that information. The report of the special committee appointed for this purpose, comprising Dr. C. L. Waller, vice president, Agricultural College of the State of Washington, Mr. George Severance, professor of farm management, Agricultural College of the State of Washington, Mr. R. K. Tiffany, hydraulic engineer, State of Washington, Mr. A. T. Strahorn, soil surveyor, United States Department of Agriculture, and Mr. George C. Kreutzer, director of reclamation economics, United States Bureau of Reclamation, follows:

The undersigned committee had conferences and inspected the proposed Columbia Basin project in eastern Washington from August 28 to August 30, 1926, inclusive, for the purpose of tentatively selecting three tracts of land of approximately 10,000 acres each which when studied in detail would give economic and agricultural information more or less representative of the project as a whole.

The inspection disclosed a wide variation in soil, topography, and rainfall conditions which affect present and future land utilization. The eastern portion of the project has a more or less uniform soil type, but in the southern portion of this area its surface is rolling to rugged, in the central portion it is smooth, and in the north gently rolling. This large area is generally farmed to wheat and is owned in tracts of from 320 to 640 acres. Some farms are much larger. Two tracts were selected to present typical conditions of this large body of land—one shown on the attached map as No. 5 on rolling to rugged topography and the other shown as No. 2 on the smooth land.

West and north of Pasco is a large body of light soil generally covered with sagebrush. Some of the benches are smooth and some of the lighter soils have a more irregular surface. Very little farming is done in this section because of low rainfall. Tract No. 4 was selected in this vicinity.

In the vicinity of Othello and extending north and south is a large body of more shallow soil. Some is cultivated and some is abandoned. The surface is generally smooth. A study of tract No. 3 will give information on this general type of soil and the questions of ownership and land utilization.

In the general vicinity of Moses Lake is a soil varying from a sandy loam to a loam generally underlain by gravel, cobbles, and boulders. Irrigation is practiced near the lake by means of pumping. The conditions which apply in this vicinity are typical of a large area and hence tract No. 1 was selected.

In the northwestern portion of the project, in the vicinity of Quincy, the land is smooth and soil similar to tract No. 2, but it is practically all abandoned, no doubt due to the low rainfall. It presents a different problem from tract No. 2, because it has no agriculture. This tract can be studied cheaply because no topographic surveys will be needed. It is shown as tract No. 6.

The committee believes that the final location of these tracts be left until those intrusted with making the investigations can study conditions on the ground. Your committee could only, in the limited time, designate their general locations.

If the size of the tracts is reduced from 10,000 acres to nine sections the cost of the investigations will be similar and can be kept within the allotted funds.

## Damage Claim Allowed

A contract of employment was entered into by the Bureau of Reclamation and C. E. Stone for the hire of a teamster and two horses for use in cutting hay on the Grand Valley project. The team belonged to Miss Anna Ott, who also owned a mower loaned to and used by Stone. The mower driven by Stone clogged and when the team was set to back the mower a clip came off the neck-yoke. One of the horses was injured so badly that it died. The Comptroller General found that the injury to the horse was caused by the use of the mower by the United States with knowledge of its defects in connection with the survey, construction, operation and maintenance of the irrigation project. Claim was accordingly allowed. (Comp. Gen. Dec. (A-14693), July 29, 1926, citing 4 Comp. Gen. 713.)

Success in growing hogs depends largely on proper management, which in turn is facilitated by the use of suitable equipment.



This Lower Yellowstone farmer believes in pure-bred hogs

## Experimental Arch Dam Tests

**T**HE Bureau of Reclamation is cooperating with the Engineering Foundation, which includes the four founder societies of civil, mechanical, mining, and electrical engineers, and the United Engineering Society, in the construction and testing of a concrete arch dam located on Stevenson Creek, a tributary of the San Joaquin River about 60 miles east of Fresno, Calif., which was especially constructed for this purpose.

J. L. Savage, designing engineer in the Denver office of the bureau, is a member of the committee having the testing of this dam in charge for the Engineering Foundation, and Engineer Ivan E. Houk, also of the Denver office, is alternate member of this committee.

The dam as constructed is of a single-arch type with vertical upstream face and constant upstream radius of 100 feet. The gorge in which the dam is constructed is sharply V-shaped in granite rock. The water supply for making the tests is furnished from an outlet of the main supply conduit of the Southern California Edison Co. directly above the dam site.

### PURPOSE OF TESTS

The purpose of making these tests on a full-sized structure is to obtain precise information concerning the stresses, movements, and changes of volume of thin arch dams, the theory of which is not in completely satisfactory condition.

Three main values will be measured in connection with the testing of this dam. These are deflection, deformation, or strain, and temperature. The deflection measurements are made from five steel towers 5 feet square, extending the full height of the dam. Deformation is measured by means of 150 Bureau of Standards carbon disk electric telemeters buried in the concrete of the structure. Temperature measurements are made with a coil of wire which will provide an electrical index of the temperature at each telemeter.

### DAM TO BE RAISED

As originally contemplated, the dam has been completed to a height of 60 feet, at a cost of \$110,000, contributed by about 50 different parties, including bankers, manufacturers, engineers, and power companies. The tests have been made of the dam at the present height of 60 feet, and it is proposed to construct the dam to a total height of 100 feet at an additional outlay of approximately \$30,000 in

order to complete the tests. The height will be increased gradually by 10-foot intervals until the dam completely gives way under the increasing water pressure.

Already 13 tests have been made of this dam with heights varying successively

## Bolivian Irrigation May Prove Feasible

*Prof. David Weeks, of the University of California, who was engaged by the Bolivian Government to investigate the possibility of converting the Altiplano, the high plateau region of Bolivia, into desirable farming and grazing land through irrigation, is reported to be optimistic as to the possibility of converting the Altiplano into a desirable region for agricultural settlers. He is quoted as of the opinion that the absence hitherto of available water can be remedied by modern irrigation and that the land can be made as fertile as the best. The one great difficulty appears to be the complete lack of fuel, but it is believed that with the existing resources of water it will be possible to generate sufficient electrical energy to provide the needed heat and power.*

from 20 to 60 feet, by 10-foot intervals. Many of these tests, especially measurements of the reservoir when empty, were made at night when there was less liability of temperature changes during the long hours required for recording the hundreds of measurements.

The testing staff is now working up the notes of the tests thus far made preparatory to a preliminary report. The experiments have proceeded in a satisfactory manner, and it is believed that much useful knowledge will be assembled that will be of value in the future design of arch concrete dams.

## Farm Bureau Federation Approves Southern Plan

Commissioner Mead has received a letter from Mr. S. H. Thompson, president of the American Farm Bureau Federation, stating that the board of directors of the federation at a recent meeting indorsed the proposed study by the Bureau of Reclamation of planned rural development in the Southern States.

Good cattle make a basis for good loans. Poor cattle constitute a hazardous proposition for both the producer and the banker who loans the money.

At Yuma the silt content of the Colorado River is estimated to average 7,000 parts per million and the total solid burden to amount yearly to 160,000,000 tons.



Tunnel and lined section of high line canal, Grand Valley project, Colo.

## *An Apple for Each Season*

*Learn to pick the right varieties*

**T**HE following schedule indicates the right time to use certain varieties of apples:

King David and Winter Banana are the first to go to market. The King David should be eaten in September and early October, while Winter Banana in October or not later than early November. The tonnage of these two varieties is light.

### *JONATHANS COME FIRST*

The first boxed apple that becomes available in quantity in the fall is the

Jonathan. It is the apple for the months of September to December. Usually it should go into consumption by the first of the year or not later than February 1. It is a general utility apple that is good for cooking and for eating out of hand.

The Grimes is an apple for November and December and the Stayman should be used in December, January, and February. The season for the Spitzenburg extends from November to January. The White Winter Pearmain is at its best from December to March. The Rome, which

is preeminently the best baker, is a good storage apple and is available from November to March.

### *LONG SEASON FOR DELICIOUS*

The season for the Delicious opens in November and extends to March. While it is true that selected lots may be held in cold storage until in May, that is rather too late for the average lots, as there is ordinarily a loss in flavor and crispness when held beyond April 1. However, it is not unusual for it to be held that long.

### *WINESAPS KEEP WELL*

The Winesap may be held the longest in cold storage. It is not unusual for this variety to be in excellent condition, if handled right, in June and July. However, it is desirable to clean up on this variety in May or before the new apples begin to reach the markets. The season extends from January to May. The Arkansas Black has practically the same season as the Winesap. It may be offered from February to May. The Black Twig should be consumed in the months of December to February.

The Newtown is known as a late winter variety, but should not be held as long as the Winesap. It may go on the market from January to April. It is excellent for cooking, baking, and for eating out of hand.

## *Honey Production on the Minidoka Project*

Henry H. Keck, of Paul, Idaho, a water user on the Minidoka project, sends in the accompanying illustration of his honey exhibit at the recent grange fair in Rupert.

Mr. Keck settled on the Minidoka project in 1904 and was one of the first beekeepers on the project, going into the business in 1910. He has had bees ever since, and states that the bee industry on the project is coming to the front more and more every year.

The honey flow this year was good, but short, owing to the dry season. However, from about 400 colonies Mr. Keck produced a carload of good, heavy bodied, water-white honey.

His exhibit was designed to show the varied uses of honey as food in the home, for cakes, candy, cookies, doughnuts, jellies of all kinds, preserves, and canned fruit. No sugar was used in any of his exhibit material.

The color scheme of his exhibit was canary yellow and white, with natural fresh sweet clover, red clover, and alfalfa blossoms at the corners of the booth and about the base.



Honey exhibit of H. H. Keck, a water user on the Minidoka project, Idaho

## Organization Activities and Project Visitors

**D. R. ELWOOD MEAD**, Commissioner of Reclamation, is planning to accompany the Commission on Reclamation and Rural Development on its trip in December to study selected properties in six Southern States.

**George C. Kreutzer**, Director of Reclamation Economics, has returned to his headquarters in Washington, D. C.

**Sr. Ludovico Ivanishevich**, civil engineer, chief of the zone of Cuyo and sanitary officer for the Republic of Argentina, was a recent visitor at the Denver office to obtain information concerning the irrigation projects. He plans to visit American Falls Dam and the Salt River and Rio Grande projects.

**S. W. Nicholtsen**, senior engineer of the irrigation service of Punjab, India, spent several days in the Denver office after his inspection of a number of the irrigation projects.

**Thomas R. Smith**, junior engineer, has been transferred from American Falls Dam to the Denver office.

**C. H. Pease** has resigned as secretary-manager of the Lower Rio Grande Water Users Association. He has been employed by Cameron County to represent the interests of the Delta before the department and before Congress in Washington in the matter of insuring permanent water rights on the Rio Grande through a treaty with Mexico and effective river control. Mr. W. W. Houser, the present president of the association, will fill both positions of president and secretary-manager until a suitable candidate can be found as successor to Mr. Pease.

**J. B. Bond**, manager of the Boise project, has resigned to accept a position with the J. G. White Co. in Mexico. He is succeeded by **William H. Tuller**, former assistant manager. **Frank J. Hanagan**, treasurer of the project, has been elected secretary as well, taking over the duties of C. R. Kollerborn, who has resigned.

**W. L. Whittemore**, superintendent of the Strawberry Valley project, has re-

signed to accept a position with the State of Tennessee on hydraulic investigations and development. **Kenneth Borg**, senior hydrographer, has been designated acting superintendent until the project is turned over to the water users' association.

**Lorenzo Lepori**, civil engineer of the Argentine Republic, has been visiting a number of the projects.

**Stan Spacek**, engineer of the Czechoslovakian Government, visited a number of the irrigation projects recently after completing the installation of the Czechoslovakian building at the Sesquicentennial Exposition in Philadelphia.

**F. S. Replogle** has been appointed as senior engineering draftsman in the Denver office by transfer from the Department of Agriculture.

**L. H. Benster**, assistant engineer, has resigned his position in the designing section of the Denver office.

**C. C. Elder**, assistant engineer, has continued his hydrographic work on the Rio Grande and tributaries between Embudo and San Marcial, N. Mex., making stream-flow measurements, collecting silt samples, installing and reading drainage wells, and conducting evaporation measurements.

**Colonel Jackson**, **Major Finch**, and **Major Arthur**, Army engineers, visited the Yuma project recently in connection with a study of protection work on the lower Colorado.

**Superintendent W. G. Elliott**, of the Ambursen Dam Co., arrived at the Stony Gorge Dam site, Orland project, during the latter part of October to plan the early erection of a construction camp. Other visitors to the dam site included **S. O. Harper**, general superintendent of construction; **J. L. Savage**, designing engineer; and **S. W. Stewart**, president; **E. W. Burroughs** and **L. A. Robb**, vice presidents; and **Office Engineer Rockwell**, of the Ambursen Dam Co.

**W. W. Snyder**, drag-line operator, has been transferred from the Grand Valley

project to the Newlands project to operate a drag line on drainage excavation.

**Prof. Duff A. Abrams**, director of research department of the United States Portland Cement Association, Chicago, and **F. H. Richardson**, **W. B. Cheek**, and **Dr. R. H. Bogue**, of the same association, with headquarters at Salt Lake City, Denver, and Washington, D. C., respectively, spent several days on the Uncompahgre project making the annual examination of the concrete blocks at the North Mesa siphon seep bed.

**M. C. Cutting**, feature writer for the Country Gentleman, was a recent visitor on the Minidoka project.

**Edwin L. Rose**, electrical engineer, and **C. J. Moody**, project manager, Flathead (Indian) project, have been gathering data on the Minidoka project concerning rural distribution of electrical energy to water users.

**Herman Krueger** and **C. H. Davis**, of the Shoshone project, and **J. B. Lamson** and **Val Kuska**, agricultural development agents, of the Chicago, Burlington & Quincy Railroad, spent several days in the Washington office in connection with the negotiation of a contract with the Deaver irrigation district for repayment on a crop-production basis.

**A. C. Cooley** and **O. F. Cook**, of the Department of Agriculture, held a conference recently on the Rio Grande project with project, irrigation district, and agricultural college officials on the proposed farm and crop survey of the project.

**J. L. Savage**, designing engineer, has been making experiments on the Klamath project to determine a satisfactory method of finishing gunite lining.

**Messrs. Partridge and MacBean**, of the California-Oregon Power Co., held a conference recently with Hydrographer **H. K. Smith**, of the Klamath project, in regard to a proposed snow survey of the Upper Klamath Lake watershed.





An exhibit of choice apples on the Uncompahgre project, Colorado

R. E. Pratt, representing the Utah-Idaho Sugar Co., has been looking over the Belle Fourche project to determine its suitability for the establishment of a sugar factory.

W. G. Harper, of the Department of Agriculture, who has been assisting on the soil survey in the lower valley, Yakima project, has been transferred to work in Utah.

P. C. Vilander, timekeeper and cost keeper on the Shoshone project, has resigned to accept a position as instructor at the State Agricultural College at Manhattan, Kans.

H. F. McPhail, engineer in the Denver office, has been making an inspection of the power system and assisting in locating and remedying trouble at the Deaver substation, Shoshone project.

H. M. Schilling, superintendent of the Umatilla project, Oregon, has been assigned as superintendent of the Huntley project, Montana, to succeed A. R. McGinness, superintendent, who has resigned to take effect early in December.

Hon. W. G. Swendsen, Commissioner of Reclamation of Idaho, has resigned to accept a position with the Amalgamated Sugar Co. His resignation has been accepted with regret by Governor Moore.

## Utah Water Commission Lauds Engineer Green

The special committee of the Utah Water Storage Commission has written a letter to Engineer William M. Green, who recently resigned from the bureau,

expressing appreciation of his services and regret at his resignation. Copy of the letter was sent to Commissioner Mead and is printed below:

Having been specially designated for that purpose, it is our privilege to record the deep and lasting regret of the Utah Water Storage Commission at the loss it is sustaining in your severing your connection with the United States Bureau of Reclamation.

The close association which the commission has enjoyed with you the past few years in working on Utah's water problems has given all its members a high regard for your technical ability, sincerity of purpose, and constant zeal in cooperating with it in every way in your power. Brought into close contact with you under circumstances which might at times have led to friction, we have experienced none of the petty differences which could so easily arise, and we have been met on all occasions with the broadmindedness of wide knowledge and the unfailing courtesy of a gentleman.

We realize the promise of your new connection justifies the severing of the old, and our best wishes for your full success go with you into your new field. As a group of individuals the commission asks your acceptance of a small visible token of its appreciation of the association now ending. We also desire to let Doctor Mead have a copy of this letter.

With kindest personal regards,

Very sincerely,

W. W. ARMSTRONG.  
RICHARD R. LYMAN.  
GEO. M. BACON.

## Southern Planned Rural Development

**A** CONFERENCE to discuss plans for the investigation of unoccupied, unsettled, and abandoned lands in the South with the view of reclaiming them through settlement was held in the Office of the Secretary of the Interior recently.

Secretary Work presided over the meeting, which was attended by a number of Senators from southern States, leading officials of railroads, and several prominent settlement experts of the South.

Congress recently authorized the expenditure of \$100,000 for the investigation into the development of areas of unsettled lands, and \$15,000 of this amount was appropriated for expenditure during the present fiscal year. Methods to be adopted by the Reclamation Bureau of the Interior Department in conducting these investigations were the subjects under discussion.

Commissioner Elwood Mead, of the Reclamation Bureau, stated at the conference that as a result of cooperation on the part of southern States six typical areas have been selected by them in different sections of the South to be studied with a view of developing a comprehensive and definite Federal policy to be reported to Congress. Senators from southern States, railroad officials, and other settlement experts present at the conference gave their approval of the plans outlined by the bureau.

Those present at the conference included: Senator Overman, of North Carolina; Senator Tyson, of Tennessee; Senator Harris, of Georgia; Howard Elliott, chairman of the Northern Pacific Railroad; Lincoln Green, assistant to the president of the Southern Railroad; W. P. Kenly, vice president of the Atlantic Coast Line Railroad; Daniel C. Roper, of South Carolina, former Commissioner of Internal Revenue; Hugh MacRae, of Wilmington, N. C., founder of the experimental colonies of Castles Haynes and St. Helena in North Carolina; Copley Amory, expert in reclamation economics of the Bureau of Reclamation; and George C. Kreutzer, director of reclamation economics.



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Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
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Milk River.....	Malta, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	do.
Minidoka.....	Burley, Idaho.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Newlands.....	Fallon, Nev.....	D. S. Stuver.....	G. B. Saow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
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Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	R. B. Smith.....	Wm. J. Burke.....	Mitchell, Nebr.
Salt River <sup>3</sup> .....	Phoenix, Ariz.....	C. C. Cragin <sup>4</sup> .....	.....	.....	.....	.....
Shoshone.....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley.....	Provo, Utah.....	W. L. Whittemore.....	H. R. Pasewalk.....	H. R. Pasewalk.....	J. R. Alexander.....	Montrose, Colo.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Umatilla.....	Hermiston, Oreg.....	.....	C. M. Voyen.....	C. M. Voyen.....	B. E. Stoutemyer.....	Portland, Oreg.
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Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	B. E. Stoutemyer.....	Portland, Oreg.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>5</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>5</sup> .....	Chas. Klingman.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Umatilla, McKay Dam.....	McKay Dam, Oreg.....	R. M. Conner <sup>5</sup> .....	.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>5</sup> .....	E. R. Mills.....	.....	do.....	do.
Sun River, Gibson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>5</sup> .....	.....	.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Dam site, Elk Creek, Calif.....	H. J. Gault <sup>5</sup> .....	C. B. Funk.....	.....	R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.

<sup>2</sup> Project operated by King Hill irrigation district.

<sup>3</sup> Project operated by Salt River Valley Water Users' Association.

<sup>4</sup> General Superintendent and Chief Engineer.

<sup>5</sup> Resident Engineer.

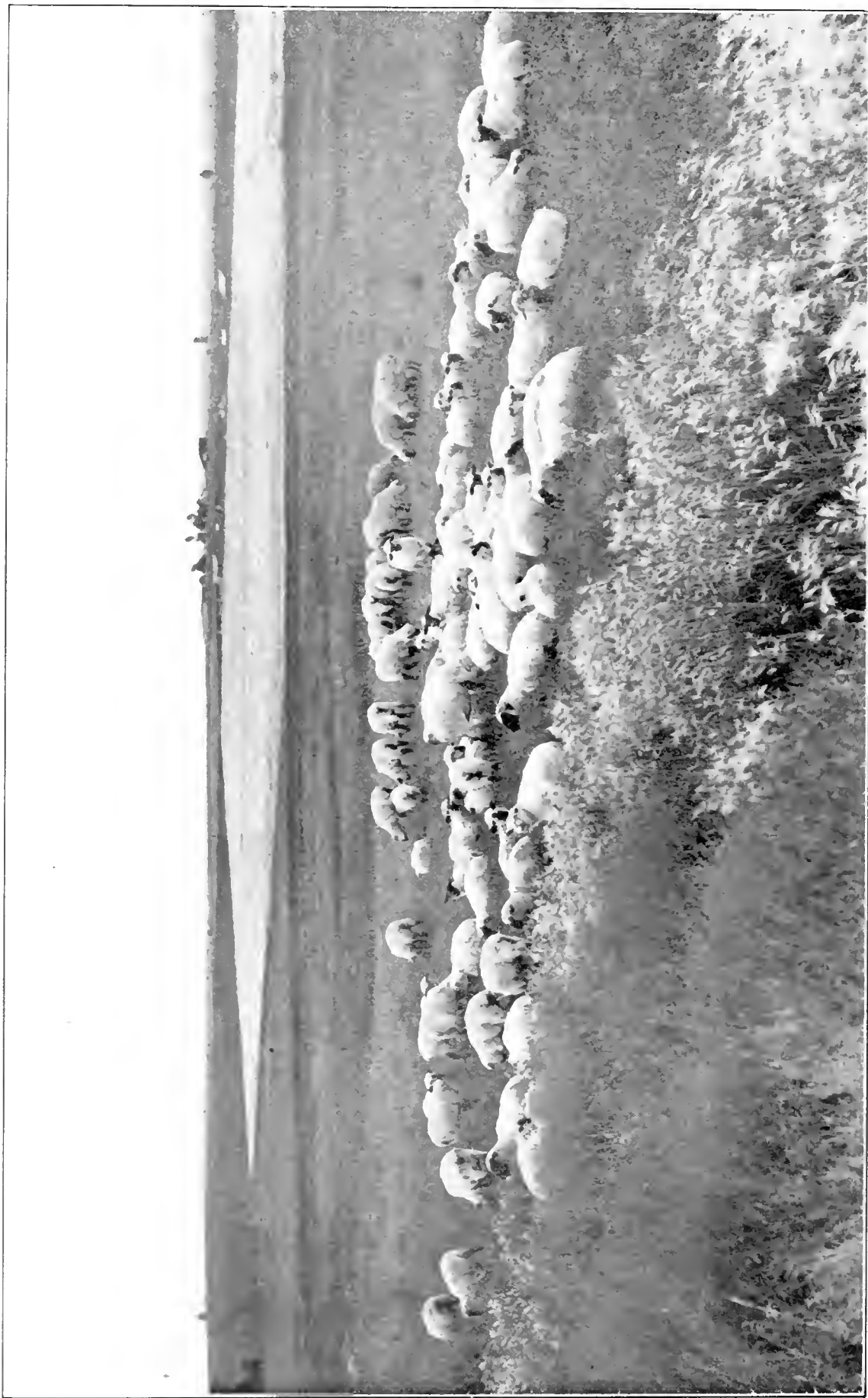
<sup>6</sup> Construction Engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Spanish Springs storage.....	Fernley, Nev.....	A. W. Walker.....	Middle Rio Grande conservancy district. State of Utah. State of Wyoming.
Dwybee.....	Boise, Idaho.....	R. J. Newell.....	
Valle.....	do.....	do.....	
Payette division, Boise.....	do.....	do.....	
Jooding.....	Jerome, Idaho.....	W. W. Johnston.....	
Middle Rio Grande.....	Denver, Colo.....	I. E. Houk.....	
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	
Heart River.....	Denver, Colo.....	G. E. Stratton.....	
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	

The NEW RECLAMATION FRA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.





Hampshire ewes and lambs on sweet clover pasture, Belle Fourche project, South Dakota

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# NEW RECLAMATION ERA

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JANUARY, 1927

NO. 1



MAKING HOGS OF THEMSELVES ON AN IRRIGATED FARM

## RECLAMATION

**I**T IS INCREASINGLY EVIDENT that the Federal Government must in the future take a leading part in the impounding of water for conservation with incidental power for the development of the irrigable lands of the arid region. The unused waters of the West are found mainly in large rivers. Works to store and distribute these have such magnitude and cost that they are not attractive to private enterprise. Water is the irreplaceable natural resource. Its precipitation can not be increased. Its storage on the higher reaches of streams, to meet growing needs, to be used repeatedly as it flows toward the seas, is a practical and prudent business policy.

The United States promises to follow the course of older irrigation countries, where recent important irrigation developments have been carried out as national undertakings. It is gratifying, therefore, that conditions on Federal reclamation projects have become satisfactory.

The gross value of crops grown with water from project works increased from \$110,000,000 in 1924 to \$131,000,000 in 1925. The adjustments made last year by Congress relieved irrigators from paying construction costs on unprofitable land, and by so doing inspired new hope and confidence in ability to meet the payments required. Construction payments by water users last year were the largest in the history of the bureau.

The anticipated reclamation fund will be fully absorbed for a number of years in the completion of old projects and the construction of projects inaugurated in the past three years. We should, however, continue to investigate and study the possibilities of a carefully planned development of promising projects, logically of governmental concern because of their physical magnitude, immense cost, and the interstate and international problems involved. Only in this way may we be fully prepared to meet intelligently the needs of our fast-growing population in the years to come.

—From the Message of President Coolidge to Congress  
December 7, 1926

# NEW RECLAMATION ERA

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HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

JANUARY, 1927

No. 1

## *Interesting High Lights on the Reclamation Projects*

**A**DVANCE crop reports for the season of 1926 are coming in to the Washington office and so far, except on the cotton-growing projects, show a marked increase in the value of crops per acre over 1925.

**G**RAPEFRUIT on the Mesa division of the Yuma project were being picked during the month, and 125 boxes were taken off approximately  $2\frac{1}{2}$  acres of  $3\frac{1}{2}$ -year old trees. The 10 acres in this tract will yield approximately 1,000 boxes, or a little over a box to the tree.

**O**RANGE growers on the Orland project had a very successful season. The first consignment of fruit caught an early market and brought attractive prices of \$4.25 to \$4.75 a box.

**A**CTIVE steps are being taken by the Ambursen Dam Co. on the construction of Stony Gorge Dam, Orland project. The company has sublet the hauling, sand and gravel pit operations, excavation, and camp operations.

**C**ONTRACT payments due from the Palisade and Mesa County districts, Grand Valley project, were paid promptly on the due date, December 1. Credit is due the directors of the district who made the payment possible by improved business methods.

**T**HE Orland Unit Water Users' Association collected and remitted to the local fiscal agent the sum of \$46,510.20 as partial payment on the construction installment due December 1. The total amount due was \$66,552.92.

**T**HE Huntley project reported the best average crops grown on the project for some years, the average return being \$42.41 per acre compared with \$38.57 in 1925. Sugar beets averaged 11.06 tons per acre.

**A**MONG the water users on the Sun River project there are signs of increased prosperity. A number of old debts have been paid off, and many of the farmers have purchased farm equipment and livestock. A noticeable number of new automobiles were purchased last fall.

**T**HE final weights of sugar beets furnished by the sugar factory showed an average for the Lower Yellowstone project of slightly under 10 tons per acre. The average sugar content was 15.53.

**A**T Guernsey Dam, North Platte project, concreting of the north spillway has been completed and work has begun on concreting the south spillway. At the end of November the dam was 86.8 per cent completed, based on gross earnings.

**T**HE Truckee-Carson irrigation district has voted in favor of taking over the operation and maintenance of the Newlands project by 345 to 141, giving 21 votes over the necessary two-thirds required by law.

**T**URKEY growers on the Newlands project received the highest prices paid on the coast last year for their birds, local turkeys being recognized generally to be of superior quality. The total pre-Thanksgiving and Thanksgiving sales from the project amounted to approximately 125,000 pounds, representing about one-third of the salable crop. The total crop to go on the market will bring the growers about \$170,000.

**T**HERE has been considerable discussion on the Rio Grande project of the formation of marketing associations, and owing to the low price of cotton, farmers are generally turning their attention to plans for more diversified crop production.

**T**HE Milk River project reports the following record yields of sugar beets: From a 20-acre tract, 18 tons per acre, part of the tract yielding in excess of 22 tons per acre; from a small tract farmed by the Utah-Idaho Sugar Co., 26 tons per acre. The sugar company has made a first payment of \$6.50 per ton.

**F**ARMERS on the Belle Fourche project are well pleased with the returns from the sugar-beet crop, and as a result it is expected that the acreage will show a material increase next season if prices remain favorable.

**T**HE use of electricity in rural homes is increasing rapidly in the Yakima Valley and on the Sunnyside and Tieton divisions of the Yakima project. There has been an increase of 20 per cent in the last year, the power company building 52 miles of line to reach 400 rural homes. The power company supplying the Yakima Valley now has 250 miles of high-voltage or primary lines and an equal amount of low-voltage line. Twenty per cent of all the company's customers live in rural districts, and the use of electrical power among the rural population of the valley is high in comparison with other sections of the country.

**S**HIPMENTS of agricultural products during November from the Shoshone project comprised 364 cars, including 281 cars of sugar beets very largely loaded by the sugar company from storage piles, and 52 cars of alfalfa meal.

**T**HE Powell Creamery, Shoshone project, purchased 11,900 pounds of butterfat during the month and manufactured 14,700 pounds of butter and 125 gallons of ice cream. The Frannie division shipped 800 gallons of cream.

## Ten-Year Construction Program for Federal Reclamation

*If adopted, the program would provide for a total expenditure of \$97,514,000 on 22 projects in 17 Western States and would preclude the undertaking of any new projects during this period*

**A** TENTATIVE 10-year construction program for Federal reclamation with total estimated expenditures amounting to \$97,514,000 that will result in the completion of all existing Government projects was proposed recently by the Interior Department.

The program contemplates construction work on 22 unfinished projects in 17 Western States with annual expenditures averaging between \$8,446,000 and \$10,826,000, a sum exceeding the probable average annual income of the reclamation fund by about \$1,000,000. If adopted, the program will preclude the undertaking of any new projects by the Government during this period.

Annual construction work to carry out the proposed program provides for the expenditure of \$10,826,000 in 1928, \$10,239,000 in 1929, \$9,118,000 in 1930, \$9,180,000 in 1931, \$8,597,000 in 1932, \$8,450,000 in 1933, \$8,521,000 in 1934, \$8,730,000 in 1935, \$8,584,000 in 1936, \$4,486,000 in 1937, with an additional \$6,823,000 to be expended thereafter. An outline of the apportionment by projects of these annual expenditures under the program follows:

### ESTIMATED PROJECT EXPENDITURES

**Yuma, Arizona-California.**—A total of \$1,291,000 to complete the distribution, drainage, and power systems of this proj-

ect. Of this amount it is proposed to expend \$35,000 in 1928, \$60,000 in 1929, \$55,000 in 1930, \$550,000 in 1931, and \$591,000 in 1932. This project under the program will be completed in 1932.

**Orland, California.**—A total of \$727,000 to construct the Stony Gorge Reservoir and complete lateral canal extensions and linings, the proposed expenditures consisting of \$605,000 in 1928, \$32,000 in 1929, \$30,000 in 1930, \$30,000 in 1931, and \$30,000 in 1932. This project under the program will be completed in 1932.

**Grand Valley, Colorado.**—A total of \$136,000 to complete distribution and drainage systems of the project divided as follows: \$30,000 in 1928, \$30,000 in 1929, \$30,000 in 1930, \$30,000 in 1931, and \$16,000 in 1932. This project under the program will be completed in 1932.

**Uneompahgre, Colorado.**—A total of \$500,000 for drainage system, \$300,000 to be expended in 1932 and \$200,000 in 1933. Under the program this project will be completed in 1933.

**Boise, Idaho.**—A total of \$6,334,000 for main canal betterments, and drainage on the Arrowrock and Payette divisions distributed as follows: \$116,000 in 1928, \$84,000 in 1929, \$50,000 in 1930, \$1,000,000 in 1932, \$1,500,000 in 1933, \$1,500,000 in 1934, \$1,500,000 in 1935, and \$584,000 in 1936. This project under the program will be completed in 1936.

**Minidoka, Idaho.**—A total of \$8,423,000 to complete American Falls Reservoir, American Falls power development, Minidoka power development, South side pumping division drainage and North side pumping unit. This proposed expenditure is divided as follows: \$1,583,000 in 1928, \$1,000,000 in 1930, \$2,671,000 in 1931, \$1,000,000 in 1932, \$1,250,000 in 1933, and \$919,000 in 1934. This project under the program will be completed in 1934.

**Milk River, Montana.**—A total of \$181,000 to complete the St. Mary Canal and Sherburne Lakes reservoirs and canal and lateral system with \$17,000 expended in 1928, \$40,000 in 1929, \$40,000 in 1930, \$49,000 in 1931, and \$35,000 in 1932. Under the program this project will be completed in 1932.

**Sun River, Montana.**—A total of \$3,653,000 for Gibson Reservoir, Fort Shaw distribution system, Northside distribution system and Northside drainage with \$1,037,000 expended in 1928, \$1,165,000 in 1929, \$500,000 in 1935, \$500,000 in 1936 and \$451,000 in 1937. This project under the program will be completed in 1937.

**Lower Yellowstone, Montana-North Dakota.**—A total of \$460,000 to complete drainage system divided as follows: \$100,000 in 1928, \$180,000 in 1929, \$180,000 in 1930. This project under the program will be completed in 1930.

**North Platte, Nebraska-Wyoming.**—A total of \$707,000 to complete Guernsey Reservoir, power development, distribution and drainage systems on the Interstate and Fort Laramie divisions, the expenditures to be divided as follows: \$450,000 in 1928, \$147,000 in 1929, \$75,000 in 1930, and \$35,000 in 1931. Under the program this project will be completed in 1931.

**Newlands, Nevada.**—A total of \$1,164,000 for Truckee storage, canal construction, a power system, and Carson division distributing system which of \$64,000 is to be expended in 1928, \$50,000 in 1929, \$50,000 in 1930, \$500,000 in 1934 and \$500,000 in 1935. This project under the program will be completed in 1935.

**Carlsbad, New Mexico.**—A total of \$1,001,000 for McMillan Reservoir claims and for Avalon water storage divided as follows: \$501,000 in 1929 and \$500,000 in 1930, thus completing this project in that year.



General view of Guernsey Dam, North Platte project, Nebraska-Wyoming, from upstream side



*Rio Grande, New Mexico-Texas.*—A total of \$590,000 to complete distribution and drainage system of the project divided as follows: \$400,000 in 1928 and \$190,000 in 1929. This project under the program will be completed in 1929.

*Owyhee, Oregon.*—A total of \$17,714,000 to construct storage, canal, and drainage systems, to be expended as follows: \$2,000,000 in 1928, \$3,000,000 in 1929, \$3,000,000 in 1930, \$3,000,000 in 1931, \$3,000,000 in 1932, \$3,000,000 in 1933, and \$714,000 in 1934, thus completing the project in 1934.

*Vale, Oregon.*—A total of \$3,115,000 for storage, canal, drainage, and distribution system, divided as follows: \$750,000 in 1928, \$750,000 in 1929, \$750,000 in 1930, and \$865,000 in 1931. This project under the program will be completed in 1931.

*Klamath, Oregon-California.*—A total of \$1,831,000 to complete Tule Lake distributing and drainage systems, Langell Valley (Clear Lake) and Langell Valley (Gerber division). Expenditure of this sum is divided as follows: \$124,000 in 1928, \$500,000 in 1932, \$500,000 in 1933, \$477,000 in 1934, and \$230,000 in 1935. This project under the program will be completed in 1935.

*Belle Fourche, South Dakota.*—A total of \$1,000,000, divided as follows: \$125,000 in 1928, \$250,000 in 1929, \$250,000 in 1930, \$250,000 in 1931, and \$125,000 in 1932. Under the program this project will be completed in 1932.

*Salt Lake Basin, Utah.*—A total of \$12,400,000 to complete Echo Reservoir and Weber Provo Canal and other divisions, distributed as follows: \$1,240,000 in 1928, \$1,000,000 in 1929, \$760,000 in 1930, \$1,400,000 in 1934, \$2,000,000 in 1935, \$2,000,000 in 1936, and \$3,000,000 in 1937. At the end of the 10-year program this project will not be completed, and it will be necessary to expend an additional \$1,000,000 thereafter to complete it.

*Okanogan, Washington.*—A total of \$320,000 to line laterals and complete pumping plant, the entire amount to be expended in 1929.

*Yakima, Washington.*—A total of \$25,579,000 for storage at Clealum Reservoir and complete construction of Roza, Kennewick, and Kittitas divisions. The expenditures on this project include \$2,000,000 in 1928, \$1,500,000 in 1929, \$1,500,000 in 1930, \$1,700,000 in 1931, \$2,000,000 in 1932, \$2,000,000 in 1933, \$3,011,000 in 1934, \$2,500,000 in 1935, \$2,500,000 in 1936, and \$2,500,000 in 1937. At the end of 1937 this project will not be entirely finished, and an expenditure of \$4,368,000 will be required thereafter.

*Riverton, Wyoming.*—A total of \$5,195,000 to complete project, divided as follows: \$600,000 in 1929, \$600,000 in 1930, \$500,000 in 1935, \$2,000,000 in 1936, and

## Special Advisers Visit Southern States

**T**HE special advisers on reclamation and rural development, appointed by Secretary Work to make a study of certain problems of reclamation and rural development in the Southern States, left Washington on December 2 and returned about the middle of the month.

The special advisers comprised Howard Elliott, chairman of the board of directors of the Northern Pacific Railway; George Soule, economist and a director of the National Bureau for Economic Research; and Daniel C. Roper, former Commissioner of Internal Revenue, and long connected with agricultural development in South Carolina. Accompanying Mr. Elliott were J. M. Hughes, land commissioner of the Northern Pacific Railway, and Dr. C. M. Duncan, economist of the Association of Railway Executives.

The Department of the Interior was represented by Dr. Elwood Mead, commissioner of the Bureau of Reclamation; Copley Amory, expert reclamation economist; Hugh MacRae, of Wilmington, N. C., special adviser; and H. A. Brown, chief of the division of settlement and economic operations of the bureau.

The party visited in order properties near Pembroke, N. C.; Charleston, S. C.; Albany, Ga.; Selma, Ala.; Hattiesburg, Miss.; and Mayland, Tenn. All of these properties had been selected by the State officials for this particular study.

During the course of the trip the party was joined by agricultural representatives of the Seaboard Air Line, Atlantic Coast Line, Central of Georgia Railway, Western of Alabama Railway, Southern Railway, and Tennessee Central Railway.

Local committees at each of the points visited cooperated to the fullest extent in furnishing automobiles for a rapid and thorough inspection of the properties.

In a letter to each of the three special advisers, Secretary Work wrote as follows:

In all of these States there are large areas of fertile but neglected, uncultivated

\$1,495,000 in 1937. Under the program this project will be completed in 1937.

*Shoshone, Wyoming.*—A total of \$5,193,000 for drainage on Garland division and distribution and drainage on Willwood division and completion of Heart Mountain division, divided as follows: \$150,000 in 1928, \$340,000 in 1929, \$248,000 in 1930, \$1,000,000 in 1935, \$1,000,000 in 1936, \$1,000,000 in 1937. Under the program this project will not be completed at the end of 10 years, and expenditures thereafter amounting to \$1,455,000 will be necessary.

land. There are swamps to be drained, areas given over to weeds, and brush to be cleared, settled, and made productive. We have learned, however, that works for reclamation will not alone result in settlement and the creation of prosperous agricultural communities. The character of the homes which can be established, the rewards for toil and thrift which settlers secure depend on adequate credit facilities, the kind of crops grown, the skill of cultivators, and on the cooperative and other organizations created for marketing crops and securing the proper social and educational advantages.

I am hopeful that a brief but intensive study of the typical areas selected by each State will show that great national benefits will result from the creation of rural communities having a definite agricultural program and organized to cooperate in social and business affairs. The decline in agriculture, shown in the statistics of these States, is not local. The exodus from the land is nation-wide. To correct it, farming communities must be organized, as the industries of cities are organized. These unoccupied lands of the South would seem to be a fine opportunity for making a demonstration of what can be done by careful planning to enable families of industry and thrift to become home owners and lead thereon a pleasant and profitable life.

The information already gathered shows conclusively the benefits which would come to these States if a successful scheme of planned community development could be put in operation. In response to an inquiry from the Bureau of Reclamation some 80 tracts of land, varying in size from a few thousand to 250,000 acres, were submitted as available for such development.

The State authorities have kindly made a study of the tracts submitted and have selected one in each State as fairly typical of the needs and opportunities for reclamation and planned rural development. The States and the Bureau of Reclamation have been gathering statistics regarding prices of land, costs of reclamation and farm development, taxes, crops which can be grown, and other facts which will help the advisers to reach conclusions as to the merits of reclamation in this section. The Bureau of Reclamation will place all its information and facilities at their service.

It is my desire that the advisers, after visiting these areas and considering the information which has been collected, should make a report advising me as to whether this investigation should be continued, and, if so, what it should include. I shall then transmit this report to the President. If conditions are regarded as justifying continuing this investigation, this report might outline what the advisers consider to be the respective spheres of Federal, State, and private activity.

The three special advisers have been selected from outside of the Government service in order that their conclusions shall represent a detached, impartial, and wholly national viewpoint as to what shall be done and the methods which should be employed.

## Land Settlement on the Federal Reclamation Projects

"We should look to the future—25, 50, or more years distant—rather than now, as the bringing in of new land is a slow process at best"

By R. F. Waller, Chief Engineer, Bureau of Reclamation

THE original reclamation act was enacted by Congress in 1902, under which irrigation projects were constructed in all of the Western States except Oklahoma. This act provided for repayment of the cost of construction in 10 annual installments without interest. No provision was made for settlement or farm development. It was expected the irrigated lands under these projects would be speedily settled with farmers who were land hungry and that prosperous and contented homes would result. Except on a very few projects these expectations were not realized, and the cause was laid to inability to meet the 10 per cent construction repayments falling due from year to year. To remedy this what was known as the extension act was passed in 1914, extending repayments to 20 annual graduated installments without interest. No provision was made in this act for settlement or farm development, and after a few years' trial, during which the construction payments required were but 2 per cent of the cost per year, the conditions were found to be little, if any, better than before the passage of the extension act, and as a whole the results continued disappointing. Something was radically wrong.

### THE FACT-FINDING COMMISSION

During 1923 Dr. Hubert Work, having assumed the high office of Secretary of the Interior, realizing that something must be done, created a fact-finding commission made up of men familiar with western conditions and recognized authorities in their respective fields of endeavor to study the situation and try to find out what was wrong. These men were Thomas E. Campbell, former governor of Arizona, chairman; James R. Garfield, of Ohio, former Secretary of the Interior; Dr. Elwood Mead, of California, the present Commissioner of the Bureau of Reclamation, who had made a life study of irrigation in all the Western States and had spent many years in similar work in Australia; Oscar E. Bradfield, of Ohio, president of the American Farm Bureau Federation; Dr. John A. Widtsoe, of Utah, ex-president of the State University, a student and author of many articles on farming and irrigation; and Clyde C. Dawson, of Colorado, an authority on irrigation law and practice.

This commission accumulated a great mass of data and facts, held hearings with the settlers, and gave months of time to the study of these conditions. Their

labors resulted in a voluminous and valuable report dated April 10, 1924.

Without taking the time to detail the various conclusions reached by this commission in connection with the past financial conditions on the several projects and its valuable constructive recommendations for adjustments of the difficulties of this nature, I quote herewith from those relating more particularly to the question at issue:

### First Peas Shipped From Yuma Project

*A full carload of green peas, the first ever shipped from the Yuma Valley, was billed recently to eastern points. The car was made up from peas picked from six fields in the valley, operated by A. T. Finch, Fred Bloom, Charles Flint, J. W. Reed, and W. J. Dixon.*

*About 150 acres of peas were grown this year on the project, and if the returns are as good as anticipated, this shipment should mark the beginning of a paying industry on the Yuma project.*

### DISPOSITION OF PRIVATE LANDS IN EXCESS OF FARM UNIT

That no reclamation project should hereafter be authorized until all privately owned land in excess of a single homestead unit for each owner shall have been acquired by the United States or by contract placed under control of the Bureau of Reclamation for subdivision and sale to settlers at a price approved by the Secretary. This price to be considered in determining what land and water will cost settlers and hence the feasibility of the project under the payment conditions of the law.

### COST OF LEVELING LAND CHARGED TO CONSTRUCTION

Hereafter the expense of leveling project lands and building suitable distribution systems for efficient and economical irrigation should be made a part of the construction costs.

### SURVEY AND CLASSIFICATION OF PROJECT LANDS

The Secretary of the Interior should undertake at once a comprehensive and detailed survey of the physical and economic features of the Federal reclamation projects, to secure information upon which the project lands may be classified with respect to their power, under a

proper agricultural program, of supporting the farmer and his family and of repaying the construction costs of the project. This survey should be in sufficient detail to enable the grouping of the farm units, under each project, into divisions or zones, each of approximately equal productive power. All lands which at the time of the survey do not possess a productive power sufficient to support the farmer's family and to repay construction costs should be grouped in one class, and all lands which are just coming into agricultural production and not yet ready to begin repayments should be grouped in another class, both of these classes of land to be exempt from requirements of repayment of the construction costs.

Such surveys of the project lands should be made periodically as the progress of knowledge may suggest, and for the purpose of determining any changes that may have accompanied the continued cultivation and irrigation of the lands.

### SETTLERS SELECTED ACCORDING TO ABILITY

Owing to the increased cost of water rights and greater expense of developing farms it is no longer possible for average settlers without capital to succeed in improving and paying for farms on these projects. Loans for development should be made a part of the reclamation policy.

This can not wisely be attempted unless consideration is given to the qualifications of settlers, which would include industry, experience, character, and possession of a part of the capital needed in improving their farms. Only those who have reasonable prospects of succeeding should be approved.

### REPAYMENT PLAN BASED ON ACRE INCOME

Experience has demonstrated that the present method for repayment of project construction costs, based upon time and percentages of cost, instead of the ability of the several classes of lands to produce, is unscientific and difficult of fulfillment. Productive power should be the basis for the annual repayments of construction costs, and for this purpose productive power of the lands should be defined to be the average gross annual acre income from the irrigated lands of a project or division thereof for the preceding 10 years, or for all years of record, if fewer than 10 years are available, and that the annual acre repayment charge should be 5 per cent of the productive power of the lands as hereinabove defined.

### AGRICULTURAL ADVISERS PROVIDED

The conditions which confront settlers on reclamation projects require them to use better tools and to adopt a better agricultural program in order to meet payments on land, improvements, and water rights. This requires the employment on the projects of trained agricultural and economic advisers who will give sound agricultural and business advice to

enable settlers to increase their farm incomes and to organize for cooperation in business and social affairs.

A brief experience has been had on some of the projects in the employment of such advisers. It showed their value, but the plan was abandoned because such employment was held to be unauthorized by the reclamation act.

The law should be so amended as to give unquestioned authority for the employment of such advisers.

#### A CREDIT FUND FOR FARM EQUIPMENT

Project settlers are in need of relief from paying high interest rates on short-time loans. They are often unable to borrow money with which to improve and equip their farms. A credit fund should be provided under competent control, from which settlers on the projects can borrow money with which to make permanent improvements or to buy needed equipment and livestock. Loans for permanent improvements, secured by the land, should run not to exceed 30 years; loans for equipment and livestock not to exceed five years. The rate of interest should be 5 per cent; payments of principal should be amortized; the making or refusing of loans should be at the discretion of the credit authorities.

On April 21, 1924, President Coolidge transmitted this report to Congress, urging the necessity of immediate revision of the reclamation law in effect at that time, and as a result the act of December 5, 1924, known as the fact-finders' act, was passed. While this act authorizes a comprehensive and detail survey to ascertain all pertinent facts, for report to Congress on proposed adjustments on many of the old projects and under certain conditions for repayment of future installments of construction charges at the rate of 5 per cent of the average gross annual crop production, it failed to provide for agricultural development and land settlement. Subsequent legislation attempted to make this a duty of the State on new projects authorized for construction.

#### THE BOARD OF SURVEY AND ADJUSTMENTS

To secure the information desired by Congress on old projects, a board of survey and adjustments was organized, consisting of Chairman Campbell and Doctor Widtsoe, of the original Fact-Finding Commission together with local representatives appointed by the governors of the various States in which projects under consideration were located. Following a careful study in the field with a competent staff of experts on soils and crop production this board made report on December 19, 1925, which resulted in the act of May 25, 1926, known as the adjustment act. This act provided for the reduction of project construction charges amounting to some

\$27,000,000, funding of unpaid accruals, and substituted a repayment plan for new and old projects based on not to exceed 40 annual installments without interest for the 5 per cent average annual crop-production plan. Again, no provision was made for agricultural development or systematic settlement of the project lands. Special legislation introduced by Senator Kendrick and Representative Winter, of Wyoming, to accomplish a start in this direction by inauguration of a limited program on two projects in which vacant Government land largely predominates also failed to receive the sanction of Congress.

### Ship First Lettuce From Yuma Project

*Recently the first car of lettuce to be shipped from the Yuma Valley went out from Somerton, billed to eastern points. This lettuce, all top-notch in quality, was from the 100-acre plot on the ranch of J. W. Gray, near Somerton. It was expected that this lettuce would bring on the eastern market from \$4.50 to \$5 a crate. If the 320 crates went at this price, it would indicate a handsome profit for Mr. Gray.*

*It is stated that with the right sort of care lettuce should average 200 crates to the acre on the Yuma project, which, with an average profit of \$1 per crate throughout the season, should make cotton farmers forsake their pet crop and turn their attention to feeding rather than clothing the public.*

This is the situation as it stands to-day, and while the Bureau of Reclamation has provided for this important, and, I believe, fundamental, requirement for successful irrigation projects, by the organization of a section of reclamation economics under the commissioner, it is handicapped by lack of definite authority, the success of this work being limited to the aid that can be secured from State and local agencies, including the railroad companies which are doing a great deal to colonize the lands under their systems. However, if the results are good there is reason to believe that Congress will go the limit to put reclamation on a sound basis.

#### NO DANGER FROM SURPLUS

Some will no doubt question the need for aided and directed settlement on irrigation projects in the West on the theory that this will increase overproduction to come in competition with an already large surplus and that such work is unnecessary for the reason that the early pioneers made

a success of irrigation by their individual efforts.

As to these objections, both of which I have heard advanced by many men who have studied this question, especially in the East, the Secretary of the Interior, Doctor Work, in a release as late as the 19th of this month, says:

Our last frontier has disappeared. The country must live within itself, and it is the part of good husbandry to protect our capital investment and restore by artificial means that which has been lost because of the demands of immediate necessity.

He said he was not disturbed by charges from agricultural States that we are at present overproducing in agriculture beyond the demands for our products, with correspondingly lowered unprofitable prices to the producer in this connection.

He said "we have been developing Federal reclamation in the West for 25 years and what we have produced is negligible when compared with the production of the whole country. The 1,242,750 acres farmed on Government irrigation projects, last year produced crop values of \$96,100,000. When these totals are compared with 372,000,000 acres farmed in the entire United States worth \$13,031,000,000, we may safely ignore the immediate danger from reclamation." He said "we should look to the future—25, 50, or more years distant—rather than now, as the bringing in of new land is a slow process at best," and further, "it is a well-recognized fact that the direction of the first step is more important than the length of it."

President Coolidge in letter of September 17, 1924, read at the annual convention of the American Mining Congress at Sacramento, September 29, 1924, in referring to our reclamation development, voices what I think should be the policy of a progressive West as follows:

Some minor criticism has been made as to the policy of our unremitting development of these projects by those who have thought we were already overproducing in agricultural products. They feel that these projects should be stayed until agricultural production has readjusted itself. These criticisms lie in the lack of understanding that these projects take many years for development, that they furnish but a small portion of the total increased food supply required even by our increase in population, that the utilization of their supplies lies in the development of the West itself. It is my purpose to unremittingly stimulate and encourage the development of these great projects by every authority of the Federal Government.

#### PRESENT USE OF IRRIGABLE AREA

In order that the present settlement situation and need for experienced settlers with financial ability to own and develop farms on Federal irrigation projects in

the West may be better understood, I have compiled from the results of statistics taken in 1925 a table showing the present use of the irrigable areas on Federal reclamation projects. The various areas given are, as far as possible, based on the results of the land classification made by the board of survey and adjustment in 1925 and thus represent productive areas after elimination of all nonproductive lands.

It is intended to show in this table, by States and projects, the locations and areas of lands which have been classified in the productive classes which were farmed and which were not farmed in 1925. It also shows the per cent farmed by tenants during 1925 and areas which, on account of inferior soils, lack of adequate water supply, need of drainage construction, or other causes, have been suspended from construction repayments pending further development and proof of the possibility of successful cultivation.

The analysis of these areas shows that 411,767 acres, or 22 per cent of the productive area available on completed projects, was idle during 1925, running from practically none on the Carlsbad project in New Mexico to over 60 per cent on the Milk River, Sun River, and Lower Yellowstone projects in Montana. Of the areas irrigated during 1925, some 11,992,

or 32 per cent out of a total of 37,737 farms, were farmed by tenants. This is largely due to the lack of settlers or farmers with the necessary capital to purchase and develop these farms, and results in a farm owner leasing, and farming, generally in an indifferent manner, from one to several adjacent farms. For proper development an owner should be in possession and farm each of these now farmed by tenants.

In addition to the project lands, water or supplemental water, was furnished to 1,237,885 acres, of which 307,215 acres, or 25 per cent, were reported as idle during the year.

New projects have been authorized by Congress that will irrigate 307,000 additional acres, practically none of which is now farmed, and will from time to time, as irrigation works are completed, require farmers financially able to develop them.

Assuming that irrigated farms comprise irrigable areas of 60 acres, which is about the average, settlers are, or will be, needed for these farms as follows:

	Acres	Farms
Present projects (idle lands).....	411,767	6,863
Present projects now farmed by tenants.....	671,520	11,192
New projects authorized.....	307,000	5,117
Warren Act contractors (idle lands).....	307,215	5,120
Total.....	1,697,502	28,292

The gross crop production on the 37,000 farms reported as irrigated on Federal projects in 1925 was \$77,608,880, or an average of \$62.45 per acre. Government storage works also supplied water to private projects under the Warren Act, which produced crops estimated to be worth \$53,665,850, or a total addition to our national income of more than \$131,000,000. More than 480,000 people lived on the 37,000 farms under these projects. The Government's expenditure in these irrigation works is about \$200,000,000. It is estimated that \$97,000,000 will be required to complete the present projects and those now authorized, the expenditure of which should duplicate these results.

#### DEVELOPMENT COSTS

To properly prepare and develop wild sagebrush land under an irrigation project requires experience and working capital ranging from \$20 to \$30 an acre on the most favorable topography and soils on Montana projects to \$1,200 an acre for citrus fruit culture, where lands must be extensively fertilized and three or four years are required to bring trees to bearing, on the Yuma Mesa project in Arizona.

In addition to the preparation of the land and building of the farm ditches, a house for the family must be provided as well as fences, barns, and farming

#### Distribution of irrigable areas on Federal reclamation projects

State and project	Irrigable	Suspended	Productive	Irrigated, 1925	Idle, 1925	Per cent idle, 1925	Per cent farmed by tenants, 1925
	Acres	Acres	Acres	Acres	Acres		
Arizona, Salt River.....	336,000	0	336,000	333,000	3,000	1.3	14.6
Arizona-California:							
Yuma.....	65,000	0	65,000	60,172	4,828	7.4	49.2
Yuma Mesa.....	7,337	0	7,337	800	6,537	89.0	-----
California, Orland.....	20,659	0	20,659	13,955	6,704	32.4	16.5
Colorado:							
Grand Valley.....	30,380	7,150	23,230	13,488	9,742	42.1	34.7
Uncompahgre.....	103,413	27,629	75,784	61,637	14,147	18.7	43.0
Idaho:							
King Hill.....	12,414	2,414	10,000	8,836	1,164	11.6	3.0
Minidoka.....	119,608	3,276	110,332	110,000	6,332	5.4	44.2
Boise.....	152,134	6,436	145,698	113,630	32,068	22.0	38.5
Montana:							
Huntley.....	33,447	13,476	19,971	18,939	1,032	5.2	61.4
Milk River.....	87,930	32,930	55,000	20,000	35,000	64.0	46.2
Sun River.....	58,258	3,810	54,448	20,468	33,980	63.0	39.7
North Dakota-Montana, Yellowstone.....	58,561	10,801	47,760	18,276	29,484	61.7	39.8
Nebraska-Wyoming, North Platte.....	234,958	36,134	198,824	161,800	37,024	18.6	60.9
Nevada, Newlands.....	77,716	4,414	73,302	42,545	30,757	42.0	12.1
New Mexico, Carlsbad.....	25,000	0	25,000	24,778	222	0	59.0
New Mexico-Texas, Rio Grande.....	155,000	0	155,000	131,917	23,083	14.9	25.0
Oregon:							
Umatilla.....	22,881	4,627	18,254	13,345	4,909	26.9	31.3
McKay.....	25,000	0	25,000	10,000	15,000	60.0	-----
Klamath.....	69,330	4,017	65,313	34,403	30,910	47.3	21.7
South Dakota, Belle Fourche.....	75,000	10,500	64,500	48,800	15,700	24.3	56.8
Utah, Strawberry Valley.....	53,890	0	53,890	46,570	7,320	13.6	16.1
Washington:							
Okanogan.....	6,058	0	6,058	4,976	1,082	17.9	10.8
Yakima-Sunnyside.....	107,600	1,849	105,751	95,000	10,751	10.0	32.6
Tieton.....	32,000	3,032	28,968	27,650	1,318	4.5	34.6
Wyoming:							
Riverton.....	20,000	0	20,000	260	19,740	98.7	-----
Shoshone.....	61,659	7,062	54,597	36,664	17,933	32.8	28.8
Willwood.....	15,000	3,000	12,000	0	12,000	100.0	-----
Subtotal for projects.....	2,066,233	182,557	1,883,676	1,471,909	411,767	22.0	32.0
Warren Act contracts.....			1,237,885	930,670	307,215	25.0	-----
New projects authorized.....			307,000		307,000		-----
Total.....			3,428,561	2,402,579	1,025,982		-----

<sup>1</sup> Estimated.



equipment. It is believed that even an experienced farmer should have available for use in development of the most favorably located 80-acre farm a minimum of \$2,000 and this should be increased up to \$5,000 or more for the unexperienced and for lands of more difficult topography and soils. Even with this amount of ready capital the farmer and his family will have to work hard before the farm is on a self-sustaining basis. He will also require additional short-time credit for which he can not afford to pay 8 or 10 per cent interest. If he purchases private land, the purchase price must also be financed on long-time payments and amortized at a low rate of interest.

### SELECTION OF SETTLERS

Investigation and selection of applicants for the vacant Government lands was first authorized by the act of December 5, 1924, which provides as follows:

That the Secretary is hereby authorized, under regulations to be promulgated by him, to require of each applicant, including preference-right ex-service men for entry to public lands on a project, such qualifications as to industry, experience, character, and capital as in his opinion are necessary to give reasonable assurance of success by the prospective settler. The Secretary is authorized to appoint boards, in part composed of private citizens, to assist in determining such qualifications.

This requirement was first put into effect this year in connection with the opening of lands under the Riverton project in Wyoming. The Secretary of the Interior has appointed an examining board, consisting of two members who are local citizens, in addition to the project superintendent, who is to act as secretary. Each applicant, before his homestead application is accepted, must appear in person before the examining board and show to the satisfaction of the board that he possesses the necessary farming experience, has good character, and reputation for industry, and possesses capital of not less than \$2,000 in cash or equivalent. Applicants of limited experience may be required to show additional capital up to \$5,000.

This will, of course, restrict settlement of these lands, but an incompetent farmer with no capital or credit is a liability and not an asset to any community.

While Congress has thus made possible a great step forward by providing for selection of entrymen on Government lands, it must be remembered that the greater part of the land under Federal reclamation is in private ownership, often in large holdings, and there is still need for some plan that will insure control over the subdivision and settlement of unimproved privately owned lands under present and future reclamation works.

### PREVENTION OF SPECULATION

In an endeavor to partially control undue speculation on private lands which come under new projects and which will be greatly increased in value by the investment of the Government in the irrigation works, Congress provided in appropriations for several new projects lately authorized, including the Owyhee-Vale in Oregon and Kittitas in Washington, for appraisal of the private lands, showing actual bona fide present value without reference to the proposed construction of irrigation works therefor, and required agreements with the present owners that until one-half the construction charges against said lands shall have been paid, no sale of any such lands shall be valid unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and that such agreement shall also provide that upon proof of fraudulent representation as to the true consideration involved in such sale, the Secretary of the Interior is authorized to cancel the water right attaching to any land involved in such fraudulent sale. In order to further prevent the inflation of land values to the detriment of the ultimate developer of the farm, contracts made also provide that if any lands after appraisal are sold at a price in excess of the value fixed in the appraisal plus the value of any water right payments made and improvements placed thereon, one-half of such excess is to be paid to the district and is to be applied by it upon the construction charges to the Government. These provisions will undoubtedly have a tendency to prevent runaway booms in land values such as crippled many of the older projects and, by foreclosures, landed a large part of the areas in the ownership of loan companies.

Doctor Mead, the present commissioner of the bureau, who has made a lifetime study of this question, in his pamphlet recently issued by the department, entitled "Federal Reclamation—What It Should Include," summarizes the principles that should be included in a successful land settlement program as follows:

1. Settlers must be selected. Developing farms under irrigation requires a certain amount of capital and certain definite qualities. Without these only disappointment can result.
2. They must be settled on the land, not in isolated units, but in groups or colonies of sufficient size to secure economic and social advantages.
3. There must be aid and direction in the preparation of the land for irrigation. In this, cooperation is important. Settlers working as a community can do many things better than as individuals working alone.
4. Many settlers who love farming and who, if given a chance, will become good farmers have inadequate capital. They

should be helped to get a start by means of credit banks or other special arrangements.

5. Markets must be studied, crop rotations suggested, and a program of marketing worked out suited to the conditions which govern transportation from the producers to the markets.

6. The payments of the initial years must be made as easy as possible.

7. The aim should be ownership of small farms rather than tenancy on larger estates.

### CAPITAL REQUIREMENTS

Assuming that ready cash in the amount of \$2,000 or the equivalent thereof is required on the most favorable lands to be developed by experienced farmers to \$5,000 or the equivalent thereof by inexperienced farmers who settle on the less favorable lands, the average capital required for development of an 80-acre farm is \$3,500. For the 28,000 farms available on completed and authorized projects and under Warren Act contracts, it is evident that \$100,000,000 capital must be provided from some source for development before these farms become going concerns with sufficient equities to make safe loans possible through the Federal farm loan banks or other agencies and to safeguard the investment of the Federal Government in the irrigation works.

Increased interest has recently been shown in aid for settlement in the West and South and of the plans advanced one is for States to take charge of the settlement and development work after the irrigation and drainage works have been provided by the Federal Government, on the theory that they have a vital interest in the quality of settlers and in the development of wealth on the land. This theory encountered fatal objections in Congress.

Another plan for financing and directing this work was to use the reclamation fund. The opposition in Congress to this was also vigorous and support is, to say the most, only lukewarm.

The third plan is to require the locality where a new project is to be located to raise a fund to supplement the settlers' capital, this fund to be revolving, and after a farm has been sufficiently improved to produce an income, loans from the Federal land bank to be substituted. The Federal land bank will not lend money on unimproved and undeveloped land. It must be assured that there is a crop income sufficient to meet the payments as they come due. This plan might operate successfully on some projects, but in sections of the country where the people are all poor and without outside resources, no such fund could be raised. This would be where it was most needed.

We still have this problem with us.



## Contract Between the United States and the Strawberry Valley Water Users' Association

*Providing for the transfer to the association of the operation and maintenance of the Strawberry Valley Irrigation Project, Utah*



Strawberry Dam and Reservoir, Strawberry Valley project, Utah

**U**NDER date of September 28, 1926, the United States entered into a contract with the Strawberry Water Users' Association, by which the care of the Strawberry Valley project, Utah, was entrusted to the association, and in which the association agreed to pay all charges incurred by the United States in connection with the project.

This project lies in the vicinity of Provo, Payson, and Spanish Fork, Utah. The project people are largely Mormons who have been practicing irrigation in the vicinity from a period antedating the Civil War. They are therefore thoroughly familiar with irrigation practice and institutions. Their land is generally divided into small holdings, intensively cultivated, and there seems to be no reason to doubt their ability to manage the project.

### CONTRACT DIFFERENCES

This contract differs greatly from the contracts that have been reviewed in the issues of the NEW RECLAMATION ERA for the months of August, September, October, November, and December, 1926, the main difference being due to the fact that the present contract is with a private corporation not having the power to tax the lands of the water users, whereas in the case of the contracts previously reviewed the agreements were with irrigation districts which are quasi-municipal corporations, having the taxing power.

At the time the Strawberry Valley project was initiated by the United States, a large portion of what is now known as the Government project had a water right from the unregulated flow of local streams which, however, did not continue throughout the growing period, there being a deficient supply of irrigation water late in the season. To remedy this situation the Government constructed Strawberry Reservoir on the watershed of the Strawberry River, and by means of a tunnel brought the stored supply to the Spanish Fork River, so that it could be used on the Strawberry Valley project. This added supply of water also enabled the Government to develop a new division of the project, known as the High Line unit. The cost of the project was roughly \$3,500,000.

On the High Line unit the water users had contracted to purchase 2 acre-feet of water per acre per annum. On the old units of the project the water users purchased as a usual matter less than 2 acre-feet of water per acre per annum, the reason being that the water users on the old units had a partial water right for their land antedating the Government project.

The association agrees to care for the transferred property in such a way that it shall remain in as good condition as of the date of transfer. The association is not to make any substantial change in the

transferred works without obtaining the consent of the Secretary of the Interior.

### OPERATION AND MAINTENANCE TO BE PAID IN ADVANCE

Beginning with the year 1927 the estimated operation and maintenance charges are to be payable in advance. Until payment to the United States for the project has been completed the association is to employ a superintendent of the project who is to be and remain satisfactory to the United States. In case this superintendent becomes unsatisfactory from the standpoint of the United States he is to be discharged upon request of the Secretary of the Interior. The association's power-house superintendent, in charge of the power plant constructed by the Government on the project, and the association's accountant are likewise to be removable at the request of the Secretary of the Interior.

At the time of the transfer of the project to the association the United States had from 6,000 to 8,000 acre-feet of water remaining in the reservoir unsold. The United States is to continue efforts to dispose of this water, but if the Government is unable to sell the water the association is to assume the obligation of making payment for same.

The association agrees to collect from the individual water users the amounts due from them under their contracts with the United States and to pay such amounts over to the United States. The association guarantees the payment of all such installments and is itself to make payment to the United States within 30 days after the due date of any amounts not collected from the respective individual water users. Amounts due the United States and uncollected at the date of the transfer are to be collected by the association and paid over to the United States. The association guarantees the collection of such accounts and is itself to make payment on or before March 1, 1927, of any amounts not theretofore collected and paid to the United States.

### RESTATEMENT OF FINANCIAL RELATIONS

On July 1, 1930, there is to be a restatement of the financial relations between the association and the United States, and on December 1, 1930, there shall be paid by the association to the United States 5 per cent of any balance

remaining in the construction account not secured by repayment contracts, and a like percentage is to become due on each December 1 thereafter until the balance is fully paid.

On March 1, 1928, and on March 1 annually thereafter the association is to pay to the United States, in each case for the preceding calendar year ending on December 31, a flat charge of one-tenth of 1 per cent of the net investment of the United States as of January 1 preceding, which charge is to cover all overhead charges for the Denver office, field legal office, and any other detached offices. Costs incurred by the United States for inspection and repairs are to be paid at the same time.

The United States owns a large body of lands needed to protect the water shed of the Strawberry Reservoir. These lands are being rented for grazing purposes, and article 22 of the contract bearing on these lands is quoted in full, as the matter is of considerable importance:

#### *Watershed Lands*

22. Receipts from watershed lands from and after October 1, 1926 (or from and after such other time as the association takes over the care, operation, and maintenance of the transferred property), shall be collected by the association and the net receipts credited by the association under Subsection I of section 4 of said act of December 5, 1924 (unless otherwise directed by order of a competent court), in such manner that each acre-foot of water sold from the project water supply shall be credited with a pro rata part of such net receipts, except that each acre-foot of water hereafter sold shall share pro rata in said receipts from and after the date of sale only. The act of Congress of April 4, 1910 (36 Stat. 285), provides in part as follows:

"All right, title, and interest of the Indians in said lands are hereby extinguished, and the title, management, and control thereof shall pass to the owners of the lands irrigated from said project whenever the management and operation of the irrigation works shall so pass under the terms of the reclamation act."

It is understood that the title, management, and control of said purchased land is not to pass to the association under said act unless and until at least 51 per cent of the project construction cost is paid to the United States, the Secretary's decision as to said date to be final and binding upon both parties hereto.

The association, as permitted by statute, is to act as fiscal agent of the United States in the collection of amounts due the United States from the water users

and others. The association has deposited a bond in the penal sum of \$20,000 to secure its faithful performance of its duties as fiscal agent.

The association is to pay to the United States the full amounts provided for in the contract, without deductions on account of the failure of some of the water users to meet their indebtedness. In order to secure funds to meet this so-called "joint liability" the association is to levy assessments upon its shares of stock to raise a sum sufficient to equal the estimated deficiencies due to the failure of some of the individual Government debtors to meet their debts.



Wind River diversion dam, Riverton project, Wyoming

### *Irrigation Development In French Morocco*

The largest and most pretentious irrigation work in French Morocco is the dam on the Oued Beth in the El Kansera gorges, which it is hoped to complete in 1929. The dam is 131 feet high, forming a lake of 162,000 acre-feet capacity. The water will be released at the rate of 353 cubic feet per second upon the plain between the Oued Beth and the Oued Redom, irrigating between 49,500 and 74,000 acres. The work has been started by the construction of a reinforced concrete irrigation canal.

AGRICULTURAL products shipped from the Minidoka project during November totaled 533 cars, 364 cars of which were potatoes.



Approximately 55,000 bushels of grain in this pile at American Falls, Idaho



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, *New Reclamation Era*



"Willow Wood Farm," home of Mrs. Olive Sanders, near Ellensburg, Washington

### New Year's Resolutions

**J**ANUARY 1 of every year brings with it the usual mental resolution to do things just a little better than we have been doing them during the year just completed.

I wonder if among the things we promised to do during the past year was included the progressive resolution to beautify the farm surroundings and particularly to plant shade trees just as the season opened up sufficiently to do this. Some have carried out their resolution according to reports from the projects.

Let us aspire high enough in our ideals and picture for ourselves a home with surroundings such as is shown in the photograph above. This is the home of Mrs. Olive Sanders, of Ellensburg, Wash., and illustrates what can be accomplished on irrigated land. The grounds surrounding her home have been well planned. See the effective planting of deciduous trees, which afford the necessary shade in the summer months and permit the sunshine to flood the home in the winter months.

This is one of the show places of that locality and is reproduced in this section merely for the purpose of keeping before

you this all-important subject, and act as an incentive to do as Mrs. Sanders has done, in order that you might enjoy the comfort, satisfaction, and pride she enjoys in this beauty spot she calls "home."

### Know What You Are Buying at January White Sales

White sales have long been associated with the beginning of the year. The thrifty housekeeper sees ahead the need for replenishments in household linens, underwear, and sometimes in summer dress materials, which can be made up at her leisure during the early spring. She counts on the January sales to take care of some of these needs, because she knows that prices will be tempting and that there will be a good choice of materials and qualities.

The term "household linens" includes practically all white or chiefly white washable materials used in household furnishing, whether made of linen or cotton. The housewife checks over for possible renewal such items as bedding, sheets, pillowcases, spreads, and mattress protectors, tablecloths, napkins, doilies, centerpieces, tray cloths, luncheon sets,

bureau and table covers, bath and other towels, washcloths, and kitchen towels. Sometimes cretonnes, prints and other washable figured materials are placed on sale with white goods by the yard during the month of January.

Those who make their underwear at home watch for opportunities to buy nainsook, long cloth, batiste, English broadcloth, and other suitable fabrics on the "white" tables. Some of these are also attractive for dresses and blouses, as well as heavier white goods like linen, poplin, or galatea, for sport skirts and middies. Dress materials at white sales, however, are not all white. The white goods predominate, but colored gingham, prints, percales, and other wash fabrics are often specially priced at this season, so it pays to be on the lookout for bargains. Both white and colored linens may usually be found among the offerings at these sales.

To help the woman who finds herself somewhat at a loss to choose among the great variety of cotton materials displayed, there is a Farmers' Bulletin No. 1449-F, Selection of Cotton Fabrics. To get it you merely write to the United States Department of Agriculture, at Washington, D. C. In it you will find a list of the best materials to use for each of the various household purposes, and in addition, a description of each of about a hundred fabrics, telling the kind of weave it has, and the common uses for it.

Why not take your daughter with you to some of the white sales, after you have read the bulletin? You can then teach her how to recognize the difference between a flimsy and a durable fabric, how to detect filled or sized materials, how to notice defects in the fiber or weave, and many other good points.

### Suit Your Type

Variations of the V-shaped neck line will be found to be most becoming to the round face. The point may be slightly rounded or it may be made square. It is not always necessary for it to be pointed. A collar may or may not be used. The square neck is also becoming to this type of face although it is not as pleasing as the pointed neck. A round neck repeats the round line of the face making it appear more round.

Vegetables and fruits are rich in minerals and vitamins and these are food substances that children especially need for building strong, healthy bodies. Children need two servings of fruit and one or preferably two servings of vegetables every day in addition to potato, so the child specialists say. Though practically all kinds of fruit and vegetables are good for children, they recommend that oranges, grapefruit, tomatoes, and green-leaf vegetables be given most frequently.

The mineral constituents of milk that are especially important to the body are phosphorus, iron, and lime. Milk is much richer in lime, the chief constituent of bones and teeth, than are most other foods, and this is one of the reasons why it is an excellent food for children.

### Meat Cakes for Children

One of the best meat dishes to have when there are young children in the family is broiled meat cakes. Everyone else will enjoy them too, so it is unnecessary to cook something else for the grownups.

For a family of five, you will need about a pound and a half of lean beef. Many persons prefer the round for meat cakes, but lean meat from the less expensive cuts, such as steaks from the fore quarter, is satisfactory. From whatever part of the carcass the meat comes, have it cut off fresh and ground twice. Various kinds of seasonings may, of course, be added but for children the meat itself with melted butter and salt added just before serving gives flavor enough. If you have an abundance of eggs, a yolk or two added to the meat gives a richer

flavor and increases the food value. This is not at all necessary, however, and excellent meat cakes can be made by simply shaping the finely ground beef into rather flat cakes and broiling them quickly in a pan, rubbed with just enough suet to keep them from sticking, or broiled under a gas flame or over hot coals. In forming the cakes be sure not to pack the meat together too firmly, for this will make the cakes hard when they are cooked. Be sure also not to overcook the cakes. If they are rare inside when served they will have more flavor and juice.

For very small children, scraped beef is better than ground beef. This is generally prepared by scraping off the more tender part of a thick piece of round steak. This scraped meat may be then

formed into cakes and broiled, or broiled on bread in the following way: Toast the bread on one side. Spread the meat with butter and broil quickly for a very few minutes directly under a gas flame.

### Girls Improve Their Own Rooms

In "Own Your Own Room" clubs girls learn how to plan a simple, attractive room, how to eliminate undesirable furnishings, how to select and arrange to best advantage what they already have, how to spend money wisely for new materials or furnishings, and how to care for their rooms. Very often it happens that when a girl has succeeded in making her own room attractive, the family becomes interested and soon the whole house is transformed.

The room shown in the illustration belongs to Joy Gann, a girl living on a farm in Albemarle County, Va. She started by filling up the holes in her walls and floor, with putty or plaster of Paris. Then she painted the walls and varnished the floor. She undertook next to make over the dilapidated fireplace, replacing broken bricks at the back and making a new cement hearth with a very little assistance from her brother. She renovated the old-fashioned furniture of the room, and made cretonne curtains in brown and orange to harmonize with the sunset tint of her walls. She replaced a broken frame of glass, made three rag rugs, and a counterpane of unbleached muslin for her bed. This she embroidered in black and orange. Many other little touches completed a very comfortable and charming room which is the admiration of all Joy's young friends.



Club member in the room she improved. Joy Gann, Albemarle County, Virginia



Illuminated arch over the State highway north of Orland, California



## Pointing the Agricultural Way

*Success of Owen H. Barrus, Utah Farmer*

*By Hon. William Spry, Commissioner, General Land Office*



O. H. Barrus and his son Ralph inspect their beets and potatoes

THINKING it may be of interest to the readers of the NEW RECLAMATION ERA, I am calling attention to a very desirable section of country which will eventually come under the proposed Salt Lake Basin project. I have a very dear friend living at Grantsville, Tooele County, Utah, who for years past has been pointing the way for his farmer neighbors to follow and, incidentally, increase their crop production. He is Owen H. Barrus, 73 years of age, and of sturdy Utah pioneer stock. He first attracted my attention when, in answer to my criticism of the way the farms of that neighborhood were neglected, he offered me \$1 for every weed I might find in either of his fields of wheat or sugar beets. I called at his place the same day, and, by the way, I left without collecting a single dollar.

My friend had sent to Minnesota for some Pioneer Dicklow wheat, and, after properly preparing the soil, he had sowed and irrigated it, until I found standing at the time of my visit the finest field of wheat I had ever seen. I learned afterwards he had threshed 80 bushels to the acre and his beets had produced 28½ tons to the acre. On further investigation, I understand he has been producing the Dicklow wheat for five years in succession with an average of 75½ bushels per acre. He was the pioneer in sugar-beet production in Tooele Valley and during the last eight years he has averaged 25 tons per acre. His farm is kept in model shape and, aside from his

wheat and sugar-beet crops, he makes it a point to feed all he produces right on the place. In addition to his field crops, he has his own garden and orchard, lawn and flowers, raises his own poultry and attends to his own bees, cures his own meats, and he is not worried in the least as to what the Government is about to do for the farmer, for he has no mortgage or incumbrance whatever. All this he is doing at 73 years of age with only the help of three boys, the oldest of whom is 14 years of age. He also has time to devote to civic affairs, having served both his city and county in an official capacity, and he has done much for his church. He has always been ready to respond in Red Cross work and other national movements and during

the late war was ever active in keeping his community up to a point of generous donation, himself giving to his country a fine manly son, who to-day sleeps with the poppies in France.

What Mr. Barrus is doing others may accomplish with the assistance of the Bureau of Reclamation. Through its beneficent policy, greater possibilities may be extended to the people of that valley and, with the combination of the water and the soil, coupled with the willingness of the people to do, I have a vision before me of that section of country flourishing as the proverbial green bay tree.

## Belle Fourche Sugar Factory Seems Assured

The following letter, under date of December 4, has been sent by W. D. Buchholz, secretary of the Belle Fourche Irrigation District, to the directors of the district:

"J. S. Smith, of the Belle Fourche Bee, has received telegram, copy of which is as follows:

CHICAGO, ILL., December 3, 1926.

Conferences to-day amount to assurance of factory at Belle Fourche, and immediate activity of sugar company; in field activity and construction of factory. Must have approval of board of directors of railroad to build both spurs which goes to them with recommendation of President Sargeant on December 14.

R. L. BRONSON.  
M. J. SMILEY.

"Yesterday we handled six Russian-German sugar-beet growers from the North Platte project and one who lived the past year near Nisland. Six out of the seven took farms in the Newell neighborhood, and they plan to raise beets from 25 to 50 acres per farm, thus indicating that about 200 acres of new beet ground have been secured for next year."



Dicklow wheat on the Barrus farm



## Poultry Raising in Mesilla Valley

By Mrs. W. P. Thorpe, Dona Ana, New Mexico, Rio Grande Project

**I**N the Mesilla Valley, N. Mex., many people are raising poultry successfully and as a chief means of livelihood because the climate here is so nearly ideal for that occupation. The dry atmosphere and mild temperature eliminate the hazards experienced by poultry raisers in less favored sections. But since the care of the home flock devolves here, as elsewhere, upon the housewife, it is as such, and not as an experienced poultry raiser, that I might venture a few suggestions on how the backyard flock may be kept at a profit.

In the first place, I would say "Keep the birds and their quarters clean"—that is, not only free from visible dirt, but also free from vermin, for wherever chickens are kept you will always find a few parasites to fight. However, there are none that can not easily be kept under control by applying the proper remedy at the proper time. and once you know how to eradicate these pests the worst of your troubles are over. The parasites most commonly found here are the stick-tight flea, the body louse, and the fowl tick, which is commonly called the "blue bug."

### GETTING RID OF PESTS

The stick-tight flea is very easily killed by the application of kerosene and lard (2 parts kerosene to 1 part lard) to the comb, wattles, and around the eyes of the fowl, and since this parasite breeds in dust and all dry trash, flood the premises occasionally.

Sodium fluoride will kill body lice, and may be used in the dry form by applying pinches of it with the finger tips to various parts of the body. It may also be used as a dip (one pound of sodium fluoride to 16 gallons of water). Dip your birds on a warm, sunny day, preferably about midday, to prevent them from taking cold. The blue bug is harder to exterminate than these other pests because it hides away in such deep cracks of the chicken house, lives such a long time without food, and can not be killed on the bird. Carbolineum has been used very effectively in fighting this pest. It is a heavy oil which should be thinned with kerosene and applied by means of a spray to the roosts and nests and forced well into the cracks and all possible hiding places. The first cost of carbolineum is greater than that of other oils which might be used, but the effects are more lasting.



Pure-bred white Leghorns on an irrigated farm on the Rio Grande project, New Mexico-Texas

### POULTRY BULLETINS AVAILABLE

You can always get bulletins from the State College on any phase of poultry raising that you desire—from the incubation and brooding of chicks to the feeding of the birds from the baby chick stage to the laying hen; and living as we do, only a few miles from our State Agricultural College, we have access to all the first hand information we need from experts who are always ready and willing to give our problems their personal attention.

Green feed is easily obtained the year round. A field of alfalfa will furnish this practically all winter, and a patch of winter wheat is excellent. Some depend upon table scraps to partly feed a small flock. The outer leaves of lettuce and vegetable trimmings of nearly all kinds help to provide the required food elements and to keep the chickens in good condition.

### CHOLERA TREATMENT

Diseases of poultry are very scarce here, but since we have in past years had some trouble with cholera I would like to give you a simple remedy that has not only cured every bird we have treated,

but has finally stamped the disease out entirely. One teaspoonful of hydrochloric acid to a gallon of water is to be placed before the sick fowls for three days. Give no other drink but sour milk and cut off all grain until the birds recover.

If the fowls have not recovered six days after the beginning of the treatment, it should be repeated at three-day intervals until the disease has disappeared. We have never found it necessary, however, to repeat the treatment. Sour milk fed to the flock every day is a good preventative for this ailment.

The housing of chickens is a simple problem here in this mild climate. Of course, if they are to be housed at all, they must be protected from drafts to prevent roup or colds.

Frame chicken houses are inexpensive, but make your fight on parasites a little harder, giving them better opportunities for hiding. Poured concrete is good, but costs more. Plastered adobe is very good, is easily kept clean by frequent white-washing, and is quite inexpensive.

### PICK YOUR BREED

I would not attempt to advise anyone as to what breed of chickens to keep, for all seem to do well here, and there is a great variety of kinds in the valley. Each has his own preference in that matter. Many prefer the Leghorns, and they can not be excelled for egg produc-

(Continued on page 14.)

# Yakima Project Offers Splendid Opportunities to Right People

*How two men made good*

**T**HROUGH the courtesy of Miss Louise F. Shields, a feature writer of the State of Washington, and Mr. E. F. Benson, agricultural development agent of the Northern Pacific Railway, the ERA is given the opportunity to print the following stories of how two men made good on the Yakima irrigation project, Washington:

## THE SUCCESS OF A SCHOOL-TEACHER WITH CHERRIES

Prof. E. Bowles, of Prosser, Wash., came to the Yakima Valley from Kansas in 1901; was principal of the Prosser schools for three years, 1901 to 1905, and from 1906 to 1910 was superintendent of schools of Mount Vernon, Wash.

He bought 10 acres 2 miles west of Prosser in 1903 for \$110 an acre, with paid-up water right. It had been plowed, leveled, and irrigated. In 1905 he set the entire place to Bing cherries, 60 per acre, about 24 by 23 feet apart.

The land was spotted, nearly half of it being very poor, and the immediate locality was frosty and lacking in air drainage. Portions of it became water-logged, and the trees on these spots died.

The orchard began bearing profitably in seven years (1912) and by using orchard heaters he has been able to secure profitable crops at least three-fourths of the time. Last year he sold 41 tons of cherries from the 6 acres now remaining in trees, the gross receipts being \$9,000, prices ranging from 13½ cents a pound down to 7 cents. In 1919 he sold 50 tons for \$11,482 from 7 acres that contained bearing trees at that time. This year, the yield from the 6 acres of cherries was 32 tons. He has raised a total of 330 tons

in the 15 years since the orchard came into bearing.

His family consists of wife and daughter, hence the work with cherries is all hired, except his own labor. He figures that he gets about one-half of the gross returns from the place for his own labor, management, and capital invested. He has lived on the place 16 years and finds the work, generally speaking, agreeable and profitable.

When Professor Bowles gave up a profitable and successful career as a school man to settle down on a little 10-acre cherry orchard, many of his friends marveled and regretted his decision for his sake, but it is safe to say that Mr. Bowles never had occasion to regret his experience with the little cherry orchard near Prosser.

His place has for many years been a sort of mecca for prospective cherry growers from every district in the Northwest who have sought to profit by his experiences.

## Belle Fourche Farmer Grows Prize Seed

*Sam H. Bober, of Newell, on the Belle Fourche project, S. Dak., has been notified that his exhibit of Grimm alfalfa seed at the International Grain and Livestock Exposition at Chicago was awarded first prize, defeating all other alfalfa seed exhibits from Western States and Canada.*

*The seed was produced on Mr. Bober's farm, 8 miles south of Newell, from a registered field of a special improved selection of a Grimm alfalfa which is superhardy and in actual tests has yielded more hay per acre than other strains of alfalfa. It is also an excellent seed producer.*

## Poultry Raising

(Continued from page 13)

tion. Personally, I prefer a large breed, and after trying out several have decided upon the Buff Orpingtons. They can scarcely be surpassed for table use, are good layers, and make wonderful capons. After 12 years' experience with my "backyard" flock and 2 years' experience as leader of a 4 H. poultry club, where I have had occasion to examine carefully records other than my own, there is no question in my mind but that poultry raising can be made a very pleasant and profitable occupation in the Mesilla Valley.

## ITALIAN COAL MINER'S SUCCESS ON SMALL FARM

This is the story of Joe Bianchi:

I was born in Italy, coming to the United States at 22 years of age. Was a miner until the summer of 1919. Left the coal mines at Cle Elum, Wash., with \$2,500 cash, all the money I had saved in this country in 20 years.

I bought 19 acres 3½ miles west of Prosser for \$7,000. Paid down on the land every dollar I had and was obliged to borrow \$300 from friends to get started. The place had practically no

improvements. A three-room shack, worth less than \$150, and the land had been cultivated but was mostly in blue grass.

I had never had any farming experience, but I watched my neighbors and did as they did. The first year set out one acre of strawberries and one-half acre of egg plant and raised corn and wheat. I started with 200 chickens; now have 500 chickens and milk 6 cows. Have 3 acres in asparagus, which has been yielding yearly about \$500 per acre gross. Have one-half acre in grapes, 20 cherry trees, and altogether about 1 acre of orchard. Have been raising tomatoes, onions, rhubarb, potatoes, etc.

Have built a new one-story modern bungalow, 5 rooms, 30 by 36, with basement, probably worth \$3,000. My place is all paid for except \$1,500 Federal farm loan, which I plan to pay off in 1928 at the end of the first five-year period. Have no other debts and have an automobile.

I have a wife and four children; one finishes high school this year.

Have been getting about \$3,000 a year gross returns from this place, from which living and operating expenses are paid, but have raised most of our living on the place from milk and butter, eggs and poultry, fruit and vegetables, etc.

I was located here by a real-estate man who is a countryman of mine, together with four other Italian farmers, all coal miners from Cle Elum and Roslyn, who located in this vicinity in July, 1919. None of us had ever farmed before, but all have succeeded and all are still here on their places. We all bought at the peak of prices, but all are fully or practically paid out now.

Land as good as mine and as well improved as when I bought, can now be had for \$150 to \$200 an acre, perhaps less.

My family is well satisfied and we have no intention of selling or moving.

Actual tests have demonstrated that while certain poor cows were yielding a profit of \$16.78 per head good cows under similar conditions were yielding a profit of \$47.64 per head, or nearly three times as much.

Unless the farmer is intelligent and aggressive enough to weed out his unprofitable cows, he himself is liable to be weeded out of the dairy industry.

## Feasible or Not?

### What Are the Factors That Decide?

UNDER the above caption, Modern Irrigation contains in a recent issue an exceedingly interesting and thoughtful article by Dr. W. L. Powers, of the Agricultural Experiment Station of the Oregon Agricultural College. Doctor Powers points out early in the article that "the unprecedented agricultural depression of the past few years, with low crop values on the one hand and increased cost of fitting and equipping irrigation farm units on the other, has increased the relative importance of economic surveys on proposed projects, and of readjustments in an economic way on existing reclamation enterprises." In other words, proper weight should be given not only to engineering problems but to the political, physical, social, and economic factors in the determination of a project's feasibility.

"Economic considerations such as location, marketing institutions, and transportation, vitally affect the earning power and cost of production. The cost of

agricultural development is an important factor in irrigation economies. The cost of development and of production may be decreased by scientific agricultural methods.

"The ability and experience of the individual farmer in irrigation agriculture is a very important factor in profitable cropping. Conditions should be made such as will attract the experienced irrigation farmer, and only where these are promising will be induced to settle on raw land."

#### FINANCIAL AID NECESSARY

Doctor Powers is equally decisive in what he has to say about the necessity for adequate credit facilities in the early years of changing the raw land into a producing farm. "Agricultural credit facilities will be a determining factor in

## Something for Nothing By Wise Crop Rotation

The starting point in business farming is crop rotation, or the establishment of systematic cropping systems to maintain soil productivity. The three farm practices which contribute most effectively to the production of such major crops as wheat, corn, and oats, are cultivation, crop rotation, and the use of fertilizers, both manure and commercial materials. These three operations rank almost equally in importance, but while the cultivation of the soil and the use of fertilizers are more or less expensive, rotation of crops does not appear as an item of expense in any farm cost-accounting system.

It is true that a farmer may spend time or energy in planning a rotation, that is, in determining a sequence of crops which will enable each crop to derive the maximum benefit from preceding crops and give the greatest benefit to subsequent crops, and in getting the rotation established on his farm. This, however, is counted as an expression of his managerial ability, for which he receives reward in the form of managerial income, if through good management he succeeds in realizing net profits. Thus, in rotation of crops, a farmer has at his command, without any monetary cost to him, a means whereby he can materially increase the output of his land and reduce crop-production costs.

the feasibility of numerous new projects. The settler should have capital or equipment amounting to half of the capital required to develop a farm unit, but better agencies and methods for financing, to meet the balance of the capital need, must be developed. Water gives added value to arid land only if the lands are fitted and farmed. Raw lands in private holdings should be disposed of in suitable farm units at a minimum price to actual settlers."

#### A FINE EXAMPLE IN DURHAM

"A planned program of land settlement by the organized colonization method will hasten the rate of settlement and shorten the time required to bring farm units to a condition of profitable production. It is believed advisable to fit a part of each farm unit and seed to a perennial crop like alfalfa. New settlers should be encouraged to invest as far as possible in growing crops or 'live stock' and hold their investment in 'dead stock' or building equipment to the least necessity during the first years. The Durham Colony, in northern California, established in 1917, included 6,000 acres. It was put on the market in 1918 and by September, 1922, all the farms had been sold, and practically all the land was in either crops or pastures within five years from time of purchase. For projects of 10,000 acres and more, census figures show 66 per cent improved when these projects are 20 years old. These demonstrations point the way for private enterprises, as well as possible Federal reclamation activities."

Table showing cost of water to irrigators on Federal reclamation projects

State and project	Per acre charges		Combined cost
	Construction 1925	Operation and maintenance, 1925	
Arizona-California:			
Yuma—			
Reservation.....	\$3.60	\$5.00	\$8.60
Valley.....	4.50	5.00	9.50
California, Orland.....	3.30	1.60	4.90
Colorado, Uncompahgre.....	1.40	1.15	2.55
Idaho, Minidoka, S. S. Pump.....	3.38	1.50	4.88
Idaho-Oregon, Boise.....	4.64	1.00	5.64
Montana:			
Huntley.....	1.46	1.50	2.96
Sun River.....	1.67	1.10	2.77
Montana-North Dakota, Lower Yellowstone.....	.90	2.08	2.98
Nebraska - Wyoming, North Platte Interstate.....	3.30	2.00	5.30
Nevada, Newlands.....	1.95	2.00	3.95
New Mexico, Carlsbad.....	2.42	1.50	3.92
New Mexico-Texas, Rio Grande.....	1.80	2.20	4.00
Oregon:			
Umatilla—			
East.....	2.60	1.67	4.27
West.....	5.52	1.21	6.73
Oregon-California, Klamath.....	1.37	1.74	3.11
South Dakota, Belle Fourche.....	1.67	.95	2.62
Utah, Strawberry Valley.....	3.72	.70	4.42
Washington:			
Okanogan.....	3.76	11.21	14.97
Yakima—			
Sunnyside.....	3.12	2.00	5.12
Tieton.....	5.25	2.00	7.25
Wyoming, Shoshone, Garland.....	2.71	1.05	3.76
Average.....	2.91	2.28	5.19

NOTE.—The average annual cost per acre for water will be further reduced \$1.26 an acre on 13 projects, due to new contracts being negotiated under crop repayment or 40-year plan.

Table showing costs of water to irrigators per acre per year on private irrigation projects

State and project	Cost per acre
California:	
Imperial irrigation district.....	\$7.97
Santa Ana V. I. Co.....	12.97
Los Angeles County water works district.....	13.40
Glendora Mutual Irrigation Co.....	60.07
Modesto irrigation district.....	3.69
West Side irrigation district.....	9.00
Byron-Bethany irrigation district.....	11.16
Bonta-Carbena irrigation district.....	8.00
Idaho, Gem irrigation district.....	7.60
Oregon:	
Payette slope.....	7.20
Ontario-Nyssa.....	5.90
Washington:	
Cascade irrigation district.....	5.43
Naches-Selah irrigation district.....	8.80
Union Gap irrigation district.....	6.62
Columbia irrigation district.....	6.17
Richland irrigation district.....	6.94
Wyoming:	
Riverton irrigation district.....	3.50
Hanover irrigation district.....	4.25
Big Horn Canal.....	4.00
Lovell Canal.....	4.00
Average.....	9.83

## Organization Activities and Project Visitors

**D**R. ELWOOD MEAD, commissioner of reclamation, returned to the Washington office on December 13 after a two weeks' trip through the States of North and South Carolina, Georgia, Alabama, Mississippi, and Tennessee with the special advisors on reclamation and rural development.

George C. Kreutzer, director of reclamation economics, visited Walterboro, S. C., on December 9, to address a meeting of the Coastal South Carolina Agricultural Development and Industrial Association.

Russell S. Lieurance, formerly employed on secondary investigations and on the Klamath project, has been reinstated as assistant engineer in the Denver office.

Senor Lorenzo Lepori, civil engineer from Argentina, is visiting the North Platte, Shoshone, Sun River, American Falls, Boise, Yakima, Kittitas, Orland, Yuma, Rio Grande, Grand Valley, and Uncompahgre projects.

The representatives of the department and of private interests appointed to study and report on operation and maintenance work and results, consisting of R. C. Carberry, representing private projects; L. M. Holt, Indian projects; and P. J. Preston, Bureau of Reclamation projects, have visited and studied methods on the Turlock, Modesto, and Merced, Yuma, Imperial Valley, and Rio Grande projects.

Frank Adams, consulting engineer, spent several days on the Yuma project on work relative to the investigation of conditions on the Colorado River Delta.

C. B. Funk, chief clerk, has been transferred from McKay Dam to the Orland project and assigned to the Stony Gorge office.

Messrs. N. Shand and S. B. Shannon, engineers of the irrigation department of the South African Government, visited the Orland project recently to inspect the engineering and agricultural features of the project.

R. A. Blackmer, junior engineer on the Grand Valley project, has resigned to enter business with his brother near Los Angeles.

W. C. Funk, of the United States Tariff Commission, spent a few days on the Uncompahgre project investigating the cost of raising onions in the Uncompahgre Valley, to determine whether additional protection is needed for the onion industry through an increased tariff.

Ferd Schlapkohl, associate engineer, and W. P. Eaton, senior engineering draftsman, have been transferred from American Falls to the Owyhee project.

Visitors to Gibson Dam, Sun River project, included O. L. Wattis, president of the Utah Construction Co., and E. H. Myrick, forest supervisor, Lewis and Clark National Forest.

### How They Grow Oranges in Orland

*Oranges so big it takes only about seven of them to make a dozen are not seen every day, but that is the sort M. S. Pritchard, a water user on the Orland project, California, is growing. The local editor was presented with a number of them weighing more than a pound each. These are navel oranges, the kind Orland is producing in commercial quantities. Mr. Pritchard is worried for fear all his oranges will prove too large to market. He might sell them as a new variety of grapefruit.*

B. E. Hayden, industrial agent, spent several days on the North Platte project in connection with exchange of entries and changes in irrigable areas on the interstate division.

O. L. Rice, junior engineer, has been transferred from the Salt Lake Basin investigations to the position of office engineer at Guernsey Dam, North Platte project.

Mr. Carson, of the Geological Survey, visited the Klamath project recently to obtain equipment and data to tie Bureau of Reclamation levels to those of the United States Geodetic Survey.

L. S. Bailey has been transferred from the Vale to the Owyhee project.

F. A. Banks, resident engineer at American Falls, has been placed in charge of the Owyhee project.

A. T. Strahorn, of the Department of Agriculture, who has been in charge of the soil survey on the Yakima, Yakima-Benton, and Kennewick irrigation districts, has returned to his headquarters in Washington, D. C.

Walker R. Young, construction engineer, Kittitas division of the Yakima project, visited the hydroelectric construction work being done by Grant, Smith & Co., at Lake Chelan, to obtain first-hand information on sand inundation and the use of "cellite" in concrete.

H. E. Dickinson, general superintendent; D. M. Davis, assistant general freight and passenger agent; J. Lever, division freight and passenger agent; and W. F. Carroll, division superintendent, all of the Chicago & North Western Railway, were recent visitors on the Riverton project.

Col. B. F. Fly, guardian of the Yuma Mesa, is a frequent and welcome visitor at the Washington office.

Gov. George H. Dern, Dr. John H. Widtsoe, William R. Wallace, and Oliver J. Grimes, of Utah, spent several days on the Yuma project to gain first-hand information concerning the Colorado River situation in connection with proposed legislation for the construction of Boulder Canyon Dam and the development of the Colorado River Basin.

Julian Hinds, until recently assistant designing engineer in the office of the Chief Engineer in Denver, has been awarded the Norman medal of the American Society of Civil Engineers for his paper on Side Channel Spillways; Hydraulic Theory, Economical Factors, and Experimental Determination of Losses. This medal is awarded annually by this society for the best paper submitted by a member during the year and considered worthy of special commendation for its merit as a contribution to engineering science.

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NO. 2



CANAL AND TUNNEL ON THE GRAND VALLEY PROJECT, COLORADO



## FURTHER EXTENSIONS OF TIME OF REPAYMENTS NOT JUSTIFIED

**T**AKING THE POSITION that any extension of time for construction repayments due on Federal reclamation projects at this time would nullify a vital policy adopted by the Government, Secretary Work, of the Interior Department, on January 14, 1927, addressed a joint letter as follows to the chairmen of the Senate and House Committees on Irrigation and Reclamation:

*"In compliance with the understanding had at the conference in this office on January 8, I submit a statement of the action which the department believes should be taken with reference to requests for extensions of time for construction repayments under existing twenty-year contracts.*

*"These requests urge inability to meet these payments, stating their projects are placed at a disadvantage as compared with those projects for which charges were adjusted under the acts of December 5, 1924, and May 25, 1926.*

*"It is the view of the department that no extensions should be granted at this time. To do so would nullify a policy adopted by the department which we believe to be vital. In some cases these payments can be made under the present contracts and ought not to be extended. In others, they are projects of high crop return and in the past payments have been met. The concessions made under the adjustment act and amendments under the Fact Finders' Act have caused great anxiety to friends of reclamation regarding the success and wisdom of Federal reclamation. Further extensions of the period of repayment at this time will strengthen this unfavorable sentiment.*

*"During the coming year it is proposed to make a comparative study of the charges on these and other projects and of their ability to meet their obligations under existing contracts. Action to remedy any inequalities found to exist will then be taken.*

*"Requests have recently been made for temporary deferment of delinquent operation and maintenance charges. Where the necessity for such deferment has been shown, it has been agreed to for periods varying from one to three years, part of the payment to be in cash and the remainder in equal payments for the time granted, with interest at 6 per cent.*

*"This is a policy the department believes to be sound and necessary to the success of Federal reclamation and one which we hope Senators and Congressmen from reclamation States will support."*

# NEW RECLAMATION ERA

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HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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## *Interesting High Lights on the Reclamation Projects*

**C**ARLOAD shipments of agricultural products from the Yuma project during 1926 totaled 3,223, valued at \$3,307,400.

**A**T Stony Gorge Dam, Orland project, excavation was begun on December 6, and during the month 1,575 cubic yards of material were removed. Foundations and anchorages were being prepared for three cableways.

**T**HE board of directors of the Orland Unit Water Users' Association has agreed to underwrite the expense of preparing an illustrated booklet describing the Orland project and the unsettled lands which are available for sale, at a cost not to exceed \$1,000, to be repaid as a part of the 1927 operation and maintenance cost.

**R**ANGE cattle and sheep continue to be brought to the Grand Valley project from adjacent ranges, and a larger number than ever before are consuming the pasturage and forage on the project. Sheep predominate, and the season has been very favorable for this industry.

**C**OLLECTIONS of charges on the Uncompahgre project during December exceeded \$80,000, which is approximately \$6,000 more than the amount received during the same month in 1925.

**A**BOUT 50 tons of dressed turkeys, valued at \$45,000, were shipped from the Orland project consigned to the Christmas markets in the San Francisco Bay region.

**R**EPAYMENTS of charges in full on construction, due December 31, have been made by the New York, Boise-Kuna, Nampa-Meridian, and Wilder districts of the Boise project.

**T**HE first semiannual installment of construction charges payable by the Burley irrigation district, Minidoka project, under the contract of March 15, 1926, came due on December 31 and was paid in full by the district.

**T**HE Laabs Cheese Co. has purchased a factory site just outside the town of Rupert, Minidoka project, and will soon move the present Rupert plant to the new location, upon which a modern cheese-making establishment will be erected.

**T**HE Utah Construction Co. started actual construction work on the Gibson Dam, Sun River project, during December. Air lines were extended to various parts of the work and excavation of rock was commenced. A start was also made on the open cut excavation at the spillway tunnel outlet.

**O**PTIONS have been obtained on the Lower Yellowstone project covering about 8,400 acres of land for sale. The Northern Pacific and the Great Northern railroads will advertise the project in about 30 farm papers. An illustrated booklet, describing the project and its opportunities, is in course of preparation.

**A**T Guernsey Dam, North Platte project, concrete work was continued on the drum crests and end piers of the south spillway. The 24-inch pipe and valves and the needle valves for the operation of the drum gates have been installed.

**T**AKING the holiday trade as a criterion, the Newlands project enjoyed a prosperous year. The merchants of Fallon state that their holiday stocks were almost entirely depleted, and comment smilingly on the fact that their customers are looking for the better grades of merchandise.

**A**N active campaign is being inaugurated on the Milk River project by the county agent to interest adjacent dry-land farmers in irrigated lands. The local organizations and large owners are displaying considerable activity in the movement, and it is expected that a constructive plan will be formulated providing for project settlement and development.

**T**HE first annual Klamath County Potato Show was held recently at Klamath Falls, with more than 100 entries from 60 different growers. At the close of the show all exhibits were auctioned off, netting nearly \$300 for the 1927 show. One lot of 200 pounds sold for 50 cents a pound.

**T**HE physical care, operation, and maintenance of the Strawberry Valley project works were turned over to the Strawberry Water Users' Association on December 31, 1926.

**A**T the end of December nearly the entire crop of apples on the Okanogan project had been sold and shipped with the exception of the Winesaps. The greater part of this crop was being held in the expectation of a rise in price.

**W**ORK by the General Construction Co. on the construction of the first division of the main canal, Kittitas division, Yakima project, was continued until December 11, when, owing to a severe snowstorm, the contractor decided to suspend operations for the winter.

**R**ETURNS from Yakima County agricultural products during 1926 amounted to \$40,650,170, or second only to the banner year of 1925, according to the annual crop report of C. A. Foresman in a recent issue of the Yakima Morning Herald.

# Cooperation of Federal Government and State in Development of Irrigation Projects<sup>1</sup>

By Elwood Mead, Commissioner of Reclamation

THE Washington Irrigation Institute has won an enviable reputation for serious purpose and solid achievement. I welcome, therefore, the opportunity to present to its members what I believe should be the basic principles of irrigation development and to urge cooperation between the States and Federal Government. I shall use the Kittitas project in this State as a typical example of conditions under which future reclamation must be carried out.

The works to irrigate the Kittitas lands are being built under a contract between the United States, acting through the Interior Department, and the Kittitas reclamation district. The district contracts to repay the entire cost and makes this obligation a lien on the land. Of this land, the United States owns 5,000 acres, the State owns 1,500 acres. The remainder, about 63,500 acres, is privately owned. A small percentage is now irrigated from small ditches which will be abandoned. The irrigated portion is highly improved. The owners can use the improved water supply as soon as it is available. There need be no misgivings about this part of the land meeting its obligations.

No one can now predict with certainty what will happen on the unimproved area. It will carry an obligation to repay nominally about \$160 an acre construction cost. In reality, the present worth of this repayment is far less because of the subsidy contained in the generous terms of payment, which is 5 per cent of the yearly crop return. If, through poor farming, the crop is only worth \$30 an acre, the settler will pay \$1.50 a year. That is less than 1 per cent of the cost. If the land is properly cultivated, crops ought to be worth \$50 an acre. Then the yearly construction payment will be \$2.50, which would give more than 60 years in which to repay the construction debt. Compared to the conditions of payment under private projects, where 6 per cent interest has to be paid on the bonded indebtedness, the Government's terms are equivalent to a gift of over \$100 an acre of the construction cost.

The price of water rights will not, therefore, be a heavy burden. It will not deter settlement nor cause settlers to fail. Operation and maintenance charges, county and State taxes, will be more serious matters. Together they will be

somewhere between \$2.50 and \$5 an acre, depending on how much is spent for roads and schools. All the irrigation payments will be low when contrasted with the payments under private works built in recent years.

## SETTLEMENT AND FARM DEVELOPMENT

This brings us to the serious and unsolved problem of American reclamation. It is, how is the worthy settler of small means to pay for the land and change a patch of unleveled sagebrush into a farm? Until we have answered this question we can not claim to have a reclamation policy.

We are working toward a solution at Kittitas. The privately owned land has been appraised and this appraisal has been approved by Secretary Work. Fixing the unimproved value will bar the land speculator who worked such wrong to settlers on older projects. But we have not fixed the terms of payment. These ought to be amortized and extend over not less than 20 years. Fifty years would be better. The interest ought to be 5 per cent. If the Government provides interest-free money to build canals, landowners or the State ought to give low interest in selling land.

The law governing the disposal of State land in this project ought to be amended by the next legislature. As it now is, the land can only be sold at auction and for cash. The minimum price per acre is more than twice the value fixed by the appraisers. Selling for cash takes money a settler needs for improvements. In this enterprise to which millions of Federal money will be donated, the State under the present law is a profiteer, making the settler pay more than the land is worth and taking no chances.

But cheap land and cheap water will not by themselves insure the prompt and successful settlement of this project. We need a thought-out scheme for the improvement and equipment of farms. Every irrigation country but ours has it. Kittitas ought to have it.

I say this to the members of the institute with confidence that it will have attention. I know the State of Washington has a higher purpose in this development than to make money. Your aspiration is to have Kittitas be an object lesson in how to create permanent and prosperous homes on the land. That you desire it to be a district of farm owners instead of tenants of mortgage companies.

## RURAL PLANNING

The first step is to lay out the ditches, roads, and farms so as to meet the needs of an intensively developed closely settled area. We must look ahead 20 years and plan this as industrial enterprises are planned. A splendid beginning has been made in the Badger Pocket section. The size of farms should be varied, so that all who love farm life may have a chance. There should be 5-acre farms for the worker without money, and 160-acre farms for those with money and ability to manage.

We can save money, time, and worry by clearing and leveling land in advance of settlement. There ought to be a booklet of houses and barn plans. Over a thousand houses will be needed. We must employ a first-class business adviser to help settlers work out cooperative plans for buying at wholesale and selling as a community.

## CREDIT IN DEVELOPING AND EQUIPPING FARMS

We now come to the missing link in American irrigation development. This is the absence of financial aid in the development and equipment of farms. Every other country but ours provides it. Sooner or later we will also. I take it that the private landowners on this project will follow the Government's lead and accept worthy settlers who have \$2,500 in cash or equipment. I hope the members of this institute will put themselves in the place of the settler with this capital, then take a pencil and paper and put down the things he will need on his farm to make it a going concern, and their cost. You will be surprised at the result. Then find, if you can, where the settler can get the additional money required, on terms that agriculture can afford. We lose the benefits of all other things if we compel the settler to pay 8 or 10 per cent interest on the money he has to borrow to develop his farm, or delay development by inability to borrow on any terms.

Australia meets that situation by advancing \$3,000 as loans on farm improvements. Denmark loans up to 75 per cent of the cost of land and improvements. Other countries do more. We are lavish in our subsidies for canals but ignore the needs of the farm. As a result, the farms on some of the older projects are falling into the control of mortgage companies. No one wants that result on Kittitas, but

<sup>1</sup> Paper presented to Washington Irrigation Institute at annual meeting Jan. 6-7, 1927, Seattle, Wash.

it will happen unless more and cheaper money is made available for farm development.

It should not, however, be advanced to settlers as loans. It should be made as payments on improvements, the character and cost of which were approved before they were started. Easy access to money tends to make borrowers improvident. They buy flivvers instead of building barns and leveling land. What I am urging is a service in farm development on a business basis to enable the money needed to pay for capitals to be earned on the farm.

It will require from \$3,000,000 to \$5,000,000 in addition to settlers' capital to make Kittitas farms what they ought to be. The interest rate on this ought not be more than 5 per cent; the repayment period ought to be that of Canada and our Federal Land Bank, which is 34½ years. The expenditure of that money ought to be in the hands of a careful, experienced business man who would only provide it to those who were workers and stayed on the job.

If an emergency fund of that kind were provided, which would enable them to go on when their capital was all spent, it would be a lodestone to draw to Kittitas the canny, careful type of farmer. It would enable him to see his way through. It would save heart-breaking delays and

many tragedies of foreclosure of short-time loans.

On general principles, I would like to see this money and this oversight of farm development provided by the State. It has an intimate knowledge of conditions. It benefits largely from increase in farms and taxable values and from the products and trade that result from irrigation. But the tendency in this country is toward centralized instead of a decentralized administration, and we must recognize that if the local authorities do not wish or are not able to perform these functions it is unwise to insist on thus attempting them.

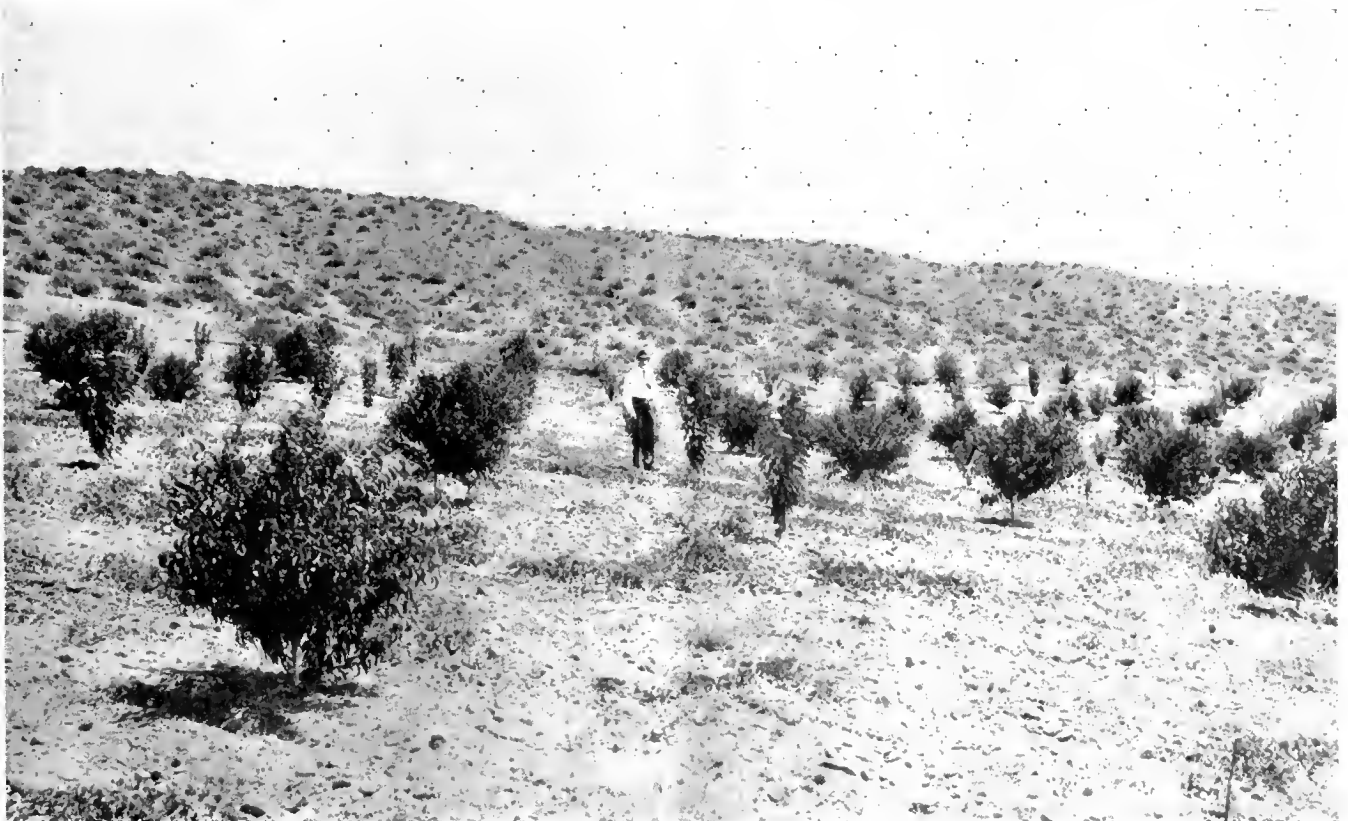
At present, neither Federal nor State authorities look with favor on aiding the settler improve his farm. They do not yet realize its importance or necessity. It means assuming a large responsibility and providing more money. The disposition is to postpone action and wait like "Micawber" for something to turn up.

We can not, however, afford here to repeat the settlement methods or be satisfied with the results obtained on some of the older projects. On these, underfinanced settlers, partial improvement of farms and ruinously high interest rates have caused so many mortgage foreclosures that banks and mortgage companies are land poor. Sixty-three

per cent of the farms on one project are cultivated by tenants. This leads to poor crops and impoverished soil. A movement is on foot to pool these farms and start a new era of settlement. The Reclamation Bureau is cooperating in a coordinated settlement scheme on four of the older projects. What this includes is illustrated on the Lower Yellowstone, where the owners of 8,000 acres have made the Reclamation Bureau a selling and settlement agent. The prices of farms have been fixed by impartial appraisers; the time in which to complete payments has been made 20 years. The interest rate is low—nowhere more than 6 per cent. With all these favorable conditions, it is still uncertain where and how we will find the kind of farmers the project needs.

In December a conference about this was held in Chicago, attended by E. C. Leedy and W. S. Webber, representing the Great Northern Railway; H. W. Byerly, representing the Northern Pacific Railway; W. S. Milhiser, manager, Holly Sugar Co., Sidney, Mont.; and George C. Kreutzer, of this bureau. This meeting resulted in the following plans for settling the Lower Yellowstone project:

*Booklet.*—A booklet is to be published by the bureau. It was agreed it should include the following:



Peach and pear trees with cantaloupes between the rows, Yakima project, Washington



A well developed home on the Lower Yellowstone project, Montana-North Dakota

(1) The plan of fixing prices, appraisals, and uniform selling contract to be explained fully.

(2) Table of farms comprising 8,000 acres to include gross area, irrigable area, price per acre, initial deposit, and half-yearly payments.

(3) Soil and climatic conditions to be explained.

(4) Character of crops that can be grown and yields.

(5) What a few of the good farmers in this project are doing, showing yields, incomes, and other information of interest to settlers.

(6) Cost of water and how charges are to be paid.

(7) The value of irrigation water in this section to be brought out.

(8) Taxes and other charges.

(9) Plans and estimates of cost of two modest cottages to be included and furnished by Mr. A. Vaux of Sidney, Mont.

(10) A list of the cost of farm equipment to include work horses, dairy cows, farm tools, and of materials commonly used for buildings and development.

(11) Transportation facilities.

(12) Sugar factory and other industries.

(13) Guidance and advice to settlers by bureau and other agencies.

**Posters.**—It was agreed that posters be printed for distribution in post offices. They would include reference to Belle Fourche, Lower Yellowstone, Willwood, Riverton, and (Tule Lake lands on) Klamath project.

**Advertising.**—The railroads will either advertise jointly or divide the farm journals and advertise separately. They intend to put liner ads, featuring the plan and the Lower Yellowstone project, in such papers as Wallace's Farmer, Wisconsin Farmer, the Capper publications, Hoard's Dairyman, Utah Farmer, and others, totaling about 30 in number.

**Follow-up work.**—The Great Northern Railway has eight traveling field men working in the Middle West and the Northern Pacific four such employees. The representatives agreed to turn all live

inquiries over to these field men to make personal visits to them and endeavor to have them consider settling at Lower Yellowstone.

**Beet farms.**—One special representative is to be engaged by the Sidney Chamber of Commerce, to get beet farmers from the beet-growing districts of Colorado and other irrigation sections, the period of employment of this man to be one year (estimated cost including salary and expenses about \$6,000).

**Credit.**—These representatives were told of our anxiety to have better credit extended to new settlers, that they could not afford to pay 10 per cent interest on money borrowed to make improvements and buy equipment. Both Messrs. Leedy and Byerly promised to call on the St. Paul Federal Land Bank and the Spokane Federal Land Bank for the purpose of

having farm loans extended to this project. Intermediate credit is extended to a certain extent by the Agricultural Credit Corporation of Minneapolis. A thousand dollars is loaned to thrifty settlers for the purchase of dairy cows, breeding ewes, or purebred sires. This corporation financed 125,000 ewes in three years; 70,000 of these were secured last year. Have loaned over \$800,000 at 6 per cent interest on three years' time. Have helped settlers buy 6,000 head of dairy cows; this year 1,800 cows were purchased.

Mr. Leedy stated that the Monarch Lumber Co. of Montana was financing settlers with building material, one-third cash, balance on time. It is understood that they have a yard on the project. (This will be looked into.)

The Holly Sugar Corporation supplies banks with money required to grow the beet crops on the project and charges the banks 3 per cent interest. The banks, in turn, charge farmers 10 per cent. Farmers require this money in July and repay it in November out of the crop. Some means of direct contact between the sugar corporation and beet growers seems desirable. Other than the agencies mentioned above, which include local banks, there is no other form of credit now available for new settlers.

**Resident economist.**—It is anticipated that this program can be put into effect early in January, when the booklet will be prepared and the Civil Service Commission will have certified an eligible list from which to select a man to take charge of the land settlement work on the project.

This is somewhat cumbersome but it is better than leaving the farms idle. It will be noted, however, that the meeting was not attended by representatives of the counties in which the project is located, or the States of Montana and North Dakota, though these are the two agencies most vitally interested in this development. The people who settle there will be citizens. Every good farmer means

(Continued on p. 21)



Beet dump and factory at Sidney, Lower Yellowstone project, Montana-North Dakota



## Progress on Belle Fourche Project

**P**LANs for the construction of a sugar factory at Belle Fourche are going forward and it is expected that actual work on the site will begin about February 1. The Utah-Idaho Sugar Co. required signatures to beet-raising contracts as a preliminary step, and this was met promptly by local farmers signing up for about 8,000 acres, including areas in the Spearfish Valley.

The publicity which the project received in connection with the sugar factory was followed by an inrush of beet farmers from the Nebraska district and others interested in irrigated farms from North Dakota and from the drought areas of South Dakota. These were nearly all tenant farmers, although a few places have changed hands. As many as 15 renters in one day were looking for farms. On December 3 a Newell firm placed six new men, who together proposed to raise 200 acres of beets. Nearly all farms that contain a set of buildings were rented at the close of the year.

Options on 95 farms covering 6,358 irrigable acres were closed during the year. This, together with the State-owned land brings the listing to 10,478 acres, or slightly above the requirements of the supplemental contract.

### CROPS

Crop production on the Belle Fourche irrigation project shows a total return of \$880,317 for the season of 1926. The yield per acre increased 10 per cent over the previous year, which indicates that specialized crops are receiving increased attention.

### Cooperation in Development Of Irrigation Projects

(Continued from p. 20)

an increase in taxation for the county and State, an increase in business for the towns and railroads. The towns and railroads understand it and are making large contributions. That the county and State are not doing anything is not an evidence of unfriendliness. It does indicate that the local authorities do not as yet recognize their responsibility. I believe this aloofness and indifference should be changed and am confident it will be.

I hope that your institute will enlist the State as a responsible partner in the settlement of Kittitas and the projects which will follow in this State.

Alfalfa, which is one of the basic crops in rotation with sugar beets, corn, and grain, occupies first place in both acreage and value. Thirty-four thousand tons of this hay are available for winter feeding of livestock, with the excess finding a market in the Black Hills and points farther east. Sixty-five tons from 13 acres are reported from one farm 2 miles east of Nisland, where a bunch of sheep are on the job to turn this bulky crop into more intensive values.

### Salt River Farmers Realize Big Profits

*The Associated Arizona\* Producer states that the farmers on the Salt River project will receive an additional annual income of \$250,000 without the increase by a single dollar in the existing investment, through a contract made recently with the Nevada Consolidated Copper Co. for the sale of power for use in the Ray mines. This means \$1 a year more to the farmers for each acre of land in the project.*

*The value of farm products on the Salt River project approximates \$25,000,000 annually. In addition, when the Horse Mesa Dam is completed, the farmers on the project will realize annually under existing guaranteed contracts an income of \$2,500,000 from the sale of power.*

Corn is the project's second most important crop. Eight thousand acres of this grain yielded up to 73 bushels per acre, with 50 to 60 bushels per acre quite common. Sheep, hogs, and cattle are turned into the fields, and not only husk the corn but pasture extensively on the leaves and stalks. A portion of the crop is siloed or cut for winter roughage, and little or none of the grain finds its way to market, because of the demand from local feeders. A farm adjoining the town of Vale produced 2,400 bushels on 40 acres, and the value of the crop is estimated to be two-thirds of what the land could have been bought for last year.

Sugar-beet acreage increased 75 per cent over the previous year, and, with a factory assured, it is expected that this crop will treble the next season. Under the Government portion of the irrigated district 25,000 tons of beets were delivered to the dump, and \$200,000 in cash was realized as the total returns in 1926. Gus

Fredlund, of Newell, harvested 20 tons per acre, which is a record for the gumbo soils.

### WORLD'S LARGEST SALTING STATION

Growing cucumbers for pickles continues to meet with favor on the project, and many farmers last year realized \$300 to \$700 from small patches of this specialized crop. The possibilities of this section for production of pickles is emphasized by the fact that at Nisland there is already the largest salting station in the world, and in addition the Squire-Dingee Co. expects to erect two more vat plants on the project to handle next year's crop. Eugene Adams, of Vale, raised 1,150 bushels of cucumbers on 2½ acres, and the cash returns were at the rate of \$300 per acre.

Small grains yielded well under favorable weather conditions that prevailed in 1926. Fred Ross, of Arpan, raised 4,000 bushels of wheat on an irrigated 80, which tops the record for production on a large acreage. Oats yielded 90 bushels on the Townsend farm near Nisland, with 1,980 bushels on 22 acres. The Gladden farm, near Vale, produced 1,375 bushels of barley on 25 acres, which is at the rate of 55 bushels per acre. Coarse grains, as a rule, are consumed locally in sheep-feeding operations, and wheat is grown as a cash crop on some rented farms where stock is limited, or where large holdings require grain farming.

### Capital Reported By Prospective Settlers

During 1926 settlement cards were filed in the Washington office from 209 prospective settlers on the irrigation projects. Among the questions to be answered on the card is one relating to the amount of capital the prospective settler has available. A tabulation of the replies to this question indicates that a considerably larger number of men with a reasonable amount of capital are being heard from than in previous years. The tabulation follows:

Available capital	Number of inquirers	Per cent of total
Less than \$500.....	17	8
\$500 to \$1,500.....	52	25
\$1,501 to \$2,500.....	42	20
\$2,501 to \$5,000.....	48	23
Over \$5,000.....	19	9
Not stated.....	31	15
<b>Total.....</b>	<b>209</b>	<b>100</b>

## President Approves First Division, Salt Lake Basin Project

*The Secretary of the Interior concludes that the project is feasible from an engineering and economic standpoint, based on searching investigation of water supply, engineering features, cost of construction, land prices, and probable cost of development*

**P**RESIDENT COOLIDGE on January 8, 1927, approved the construction of the first division of the Salt Lake Basin project, Utah, as submitted to him in the following letter from the Secretary of the Interior:

DEPARTMENT OF THE INTERIOR,  
Washington, January 7, 1927.

The PRESIDENT,

The White House.

MY DEAR MR. PRESIDENT: I wish to make, concerning the first division of the Salt Lake Basin project, in Utah, the following statement and finding of feasibility:

Section 4 of the act of June 25, 1910 (36 Stat. 835), provides, in effect, that after the date of that act no irrigation project to be constructed under the act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto shall be undertaken unless and until the project shall have been recommended by the Secretary of the Interior and approved by the direct order of the President.

Subsection B, section 4, act of December 5, 1924 (43 Stat. 701), provides as follows:

That no new project or new division of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

The various features of the first division of the project requiring investigation and report under subsection B, section 4, act of December 5, 1924, *supra*, will be discussed in the order in which presented in that subsection, as follows:

### WATER SUPPLY

*Source.*—Weber River has a mean annual flow of about 570,000 acre-feet. There is sufficient flood water in the Weber River to fill the Echo Reservoir (which the United States proposes to construct) in most years with holdover from years of large run-off. It will be possible to fill the reservoir on an average of three years out of four based on records for the past 20 years. By ex-

change of Echo Reservoir storage and diversion of surplus Weber River flood waters, about 15,000 acre-feet can be diverted annually from a point on the Weber River above the reservoir to the Provo River by means of a canal through the Kamas Bench. By this means it will be possible to lengthen the flood-flow season and increase the low-water flow on the Provo River.

*Storage capacity.*—The storage capacity of Echo Reservoir on Weber River is 74,000 acre-feet.

### ENGINEERING FEATURES

*Storage dam.*—The proposed dam is to consist of an earthen embankment across Weber Valley about one-half mile above the town of Echo, Utah. The maximum height of the dam will be 125 feet and its length about 1,800 feet. The face of dam is to be protected by riprap consisting of 4 feet thickness of dump rock. The spillway capacity is to be adjusted for floods of 15,000 second-feet. Outlet works will have a capacity of 1,200 second-feet. The embankment will contain about 1,400,000 cubic yards of material.

*Main diversion canal.*—A diversion canal is proposed to be constructed to conduct the waters of the Weber River across the Kamas Bench to the Provo River system for use on lands in Utah and Salt Lake Counties. This canal is to be located about 25 miles upstream from Echo Reservoir, and is to be about 8 miles in length with a capacity of 210 second-feet.

*Laterals.*—No canals (other than the diversion canal), laterals, or drainage construction is contemplated as a part of the first division of the project, the plan being simply at the present time to supply storage facilities for areas under existing canals in the Weber and Provo River Valleys.

*Drainage.*—No drainage will be provided at this time for the first division.

### COST OF CONSTRUCTION BY FEATURES

Storage dam (including relocation of Union Pacific Railroad and Lincoln Highway, rights of way, etc.)	\$2, 700, 000
Diversion canal from Weber River to Provo River	300, 000

Total, first division of Salt Lake Basin project	3, 000, 000
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### TOTAL COST

As shown above, the total cost of the first division of this project is estimated to be about \$3,000,000.

### LAND PRICES AND PROBABLE COST OF DEVELOPMENT

The first division of the Salt Lake Basin project will benefit about 80,000 acres of irrigable land in the counties of Summit, Morgan, Weber, Davis, Wasatch, Utah, and Salt Lake, Utah. All of this land is colonized and settled and a supplemental or late season water supply will be provided. The soil consists of loam, clay loam, and sandy loam. Good crops of alfalfa, sugar beets, wheat, fruits, canning produce, and other crops common to this altitude (between 4,000 and 5,000 feet) are raised. Excellent marketing and transportation facilities exist. As an example of farm income, crop values on four typical farms are given:

	Area	Total crop value	Crop value per acre
	<i>Acres</i>		
1.....	32.0	\$2, 509	\$72.00
2.....	24.0	1, 768	73.00
3.....	20.0	1, 143	57.00
4.....	26.0	1, 260	49.00
Average.....	25.5	1, 670	65.60

### FINDING REGARDING FEASIBILITY OF PROJECT

The foregoing data justify the conclusion that the project is feasible from an engineering, agricultural, and economic standpoint, and I accordingly so find and declare.

### ADAPTABILITY OF LAND TO SETTLEMENT AND FARM HOMES

The land embraced in the project is of more than average fertility. The area included within the project can be utilized in production of crops and is prepared for the effective application of water. Good yields of all crops grown in this locality are assured. The farmers at present on the lands as a rule have savings and checking accounts in the local banks, are industrious, pay their debts, and constitute a solid class of citizens in the State of Utah.

### PROBABLE RETURN TO RECLAMATION FUND OF COST OF CONSTRUCTION

A contract is about to be entered into with the Weber River Water Users' Association for repayment of the cost of the

project on the basis of 20 equal annual installments. The works can be completed in less than five years, if Congress appropriates the necessary funds, and payments in accordance with the terms of the proposed contract will begin on December 1 of the year in which the Secretary announces the completion of expenditures for the first unit. The average construction cost of this division of the project will probably be about \$40 an acre, making the average yearly payment \$2 an acre. To this will be added the annual expense of operation and maintenance.

The total yearly charge will not be greater than the irrigators can pay, and it is believed that the additional water supply will increase incomes so as to enable the irrigators to meet the required payments on this project.

The settlers will be under specially favorable conditions to respond to the development due to the increased water supply. The agricultural production in the Nation is not keeping pace with increase in population. These lands must continue to be intensively cultivated and the settlers will be helped so far as practicable to organize for cooperation in production and marketing. The favorable conditions recited justify the belief that this project will return the cost thereof.

Because of the urgent need for a larger water supply by the present settlers on the 80,000 acres to be benefited by the first division of the project and because of the additional development of this area which will ensue from the construction, the project is destined greatly to benefit the Nation. I recommend approval of the first division of the project as outlined and request authority to make contracts for and to proceed with its construction.

Very truly yours,

HUBERT WORK.

Approved January 8, 1927.

CALVIN COOLIDGE,  
President.

## Group-Settlement Plan In Western Australia

A group-settlement scheme is carried on in Western Australia under which a free grant of Crown land up to 160 acres is made to selected applicants. These settlers work together for two to two and a half years, putting up buildings and clearing and preparing the land for farming. They are under the direction of a foreman and are paid 10 shillings for maintenance each day they work. At the end of the period they are expected to become self-supporting and the cost of improvements on each block is repayable by the settler, a 30-year term being allowed.

## Cold Storage in the Yakima Valley

By J. L. Lytle, Superintendent, Yakima Project

OF THE 350,000 acres under irrigation in the Yakima Valley, Wash., approximately 48,000 acres are in fruit, including apples, pears, peaches, plums, cherries, etc. Of this, 35,863 acres are located on projects developed by the Department of the Interior, comprising 31,600 acres within the Yakima project of the Bureau of Reclamation and 4,200 acres on the Wapato Indian Reservation developed by the Bureau of Indian Affairs.

The packing, storing, and marketing of the crop produced in the area in orchards has developed into an industry of appreciable size, and in connection with it cold-storage plants have been constructed throughout the Yakima Valley with a total capacity of 7,280 carloads.

The accompanying table shows the capacity, in carloads, of the cold-storage plants located in the various districts in the valley.

This storage is provided in 33 cold-storage plants with capacities varying from 5 to 700 carloads each, and is controlled as follows: Fruit dealers, 71 per cent; cooperative marketing organizations, 29 per cent.

With adequate and properly located cold-storage plants, the growers and local cooperative selling agencies are able to keep control of the crop until they are ready to sell, and thus to a considerable extent save themselves from the necessity of placing their product in the hands of consignment dealers. It also enables them to put their crop on the market in

prime condition, helps to prevent glutting the market, and is of material aid during the time of car shortage, local storage usually being cheaper than foreign storage.

	Capacity
	Carloads <sup>1</sup>
<b>DISTRICTS</b>	
Zillah district.....	550
Yakima district.....	4,435
Wiley City and Yakima Valley points.....	275
Tieton project.....	75
Selah district.....	255
Reservation district.....	390
Kennewick district.....	245
Grandview district.....	375
Donald-Buena district.....	400
Naches Valley.....	275
Kittitas Valley.....	5
Total available storage.....	7,280
<b>OWNERSHIP</b>	
Commercial dealers.....	5,170
Cooperative organizations.....	2,110
Total.....	7,280

<sup>1</sup> All quantities, carloads of 756 boxes of apples.

It is estimated that the construction cost of cold-storage plants is from \$491 to \$577 per carload storage capacity, on the basis of each car containing 756 boxes of apples. From this it is apparent that the investment in cold storage in the Yakima Valley runs into rather large figures, probably exceeding \$3,800,000.

The cooperative association is a natural agency for interpreting and distributing the information that will aid its members to adjust production to probable demand.



A fine first crop of wheat growing on Tula Lake bed lands, Klamath project, Oregon-California

## Contract Between United States and Greenfields Irrigation District

THE United States has been engaged for several years in the construction of the Sun River project, Montana. The Greenfields irrigation district comprises a portion of the area of the project. The United States had expended up to December 31, 1925, the sum of \$4,028,514 for the benefit of the district lands. This amount had provided only a partial water supply for the district lands, storage water being needed to supplement the natural stream flow made available by this expenditure. Also additional canals and other structures were needed to complete the irrigation plant for the district.

### REPAYMENT PROVISIONS

It had been determined by reconnaissance surveys that a satisfactory location for a reservoir exists at what is now called the Gibson Dam site in Sun River Canyon. Water-supply studies had shown that the water supply at that point was sufficient to warrant the construction of a reservoir. Congress appropriated money for the initiation of the construction, and a contract dated June 22, 1926, was then made with the Greenfields irrigation district by which the district agreed to repay (a) the expenditure of \$4,028,514 above referred to; (b) the amount, to be determined by the Secretary of the Interior, expended by the United States between December 31, 1925, and January 1, 1926, for the benefit of the district land; and (c) the amount to be expended for the benefit of the district in 1926 and later, but not exceeding \$5,471,486. "Said maximum sum" (the quotation is from article 5 of the contract) "shall be

expended in the construction of storage works in the Sun River Canyon, in the enlargement of the main canal supplying district lands, in the building of a distribution system for additional district lands not at the present time irrigable from constructed works, and in the construction of additional drainage facilities, or so much of said works as, in the opinion of the Secretary, is necessary and advisable."

The contract provides for the repayment by the district of the total construction cost. If the irrigation system is completed for a portion of the area of the district before the entire district irrigation plant is completed, the Secretary is authorized to require the district to begin the payment of construction charges from the completed portion of the project and to fix a provisional construction charge for such part of the project, which provisional charge is to be adjusted later when the cost of the entire project is ascertained. The completion of the construction program is contingent upon Congress making the necessary appropriations, but if work is discontinued before the entire program is finished, the district is to make payment in 40 years of the amount expended by the United States up to the date of completion. Payment of the construction charges on the completed project or on any completed part of the project is to be made under the terms fixed by subsection F of section 4 of the act of Congress of December 5, 1924 (43 Stat. 672); that is, payments will be proportioned to the gross crop returns upon the land from

which the charges are being collected, 5 per cent of the gross crop return being payable annually.

The Secretary will announce to the district the amount payable by the district each year, and the district is to levy assessments so that the full amount will be paid to the United States on the respective due dates without deduction on account of the failure of some of the landowners to pay their taxes before same become delinquent. In other words, the district assumes what the water users are accustomed to refer to as "joint liability."

### OPERATION OF WORKS

During the construction period the works necessary for irrigating the lands of the district are to be operated and maintained by the United States and water will be delivered upon temporary rental applications requiring payment in advance. However, if the irrigation system is completed for any portion of the project before the works as a whole are built, the Secretary is empowered to turn over to the district the duty of operating a part of the irrigation plant. Immediately upon the termination of the construction program the Secretary will give notice thereof to the district, and the district is thereupon to assume the duty and expense of operating and maintaining the works necessary for irrigating the district lands.

During the period while the construction charges are being paid the manager or superintendent employed by the district is to be and remain satisfactory to the United States, the Secretary being empowered to call upon the district to discharge any manager or superintendent found by the United States to be unsatisfactory.

The United States reserves the right to inspect the transferred works so as to ascertain whether they are being properly cared for. The cost of such inspection is to be paid by the district. The district agrees to make any repairs called for by such inspection, and if it fails to do so, water may be shut off until the repairs are made, or the United States may take back the care of the transferred works, or itself make the repairs and charge the cost to the district.

### REFUSAL OF WATER ON DEFAULT

Article 19 of the contract, because of its importance, is quoted in full:

"19. *Refusal of water in case of default.*—The United States reserves the right to refuse to deliver water or to continue to deliver water to the district



Pure bred dairy cattle on the Sun River project, Montana



in the event of default for a period of more than one year in any payment due the United States from the district, and for that purpose may take over the control of the headworks and diversion works of said canal system and regulate the same. Instead of refusing delivery of water to the district, the United States may, at its option, reduce the amount of water delivered, and in the event of the operation and control of said headworks and diversion works by the United States for the purposes aforesaid, the district will pay to the United States each year, the cost of said operation and control. The district shall refuse water service to all lands which may be in default for more than one year in the payment of any construction or operation and maintenance charge of the district. The provisions of this article are not exclusive, and shall not in any manner hinder the United States from exercising any other remedy to enforce collection of any amount due hereunder."

When the district has completed payment of the construction charges, the United States is to quitclaim to the district all of the interest of the United States in the Greenfields division of the Sun River project, together with appurtenant water rights, except that the reservoirs are to be retained by the United States until otherwise provided by Congress.

The execution of the contract was authorized, as required by the Montana law, by a petition of the landowners in the district, and the contract was confirmed by the Montana courts.



Cement lined canal on the Newlands project, Nevada

### *Turkeys Bring \$10,000 To Sunnyside Farmers*

Twenty-two hundred turkeys made up a car lot shipped to Tacoma recently from the Sunnyside division of the Yakima project, Washington. This is the first car lot of the holiday birds ever billed from the Sunnyside division, and represented \$10,000 paid to the growers. The price was 45 cents a pound.

Climatic conditions in the Yakima Valley are favorable for turkey raising, and there is a tendency toward an increase in the number every year. There is a good demand for poultry of all kinds grown on the project. According to the 1926 crop report poultry on the project numbered 193,360. This is an excellent showing, but there is room for a large increase.

### *Australian Reservoir Has Largest Capacity*

Construction is in progress on the Nathan Reservoir, Queensland, Australia, which on completion will have a capacity of 2,485,000 acre-feet at the spillway crest, and by means of 5 feet of shuttering will impound an additional 514,100 acre-feet, bringing the total possible storage for irrigation purposes to 2,999,393 acre-feet.

The capacity of the Elephant Butte Reservoir on the Rio Grande project, New Mexico-Texas, is 2,638,000 acre-feet at the spillway crest. Present plans for the proposed Boulder Canyon Dam on the Colorado River provide for a reservoir with a capacity of 26,000,000 acre-feet.

The primary purpose of a farmers' cooperative association is to conduct business activities incident to the marketing of the commodities produced by its members. All other plans and aims must be secondary.



Part of E. Murray's flock of egg producers, Belle Fourche project, South Dakota





## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



### Tree Planting

WE are pleased to note that some of the project newspapers are printing articles advocating the planting of trees.

Here is an item from the January issue of the Churchill County Eagle, of Fallon, Nev. (Newlands project):

*"Why Not Plant Trees in Favorable Odd Nooks and Corners on Project Farms"*

"While the Government is having a great deal to say in its forest reserve propaganda about reforestation, and this is a good thing, we wonder if there are not a good many nooks and corners on Newlands project farms that might be utilized for growing cottonwood, poplar, or other trees that would come in handy for fire wood a few years later.

"It does not take a cottonwood long to attain pretty good size in the Lahontan Valley and many farmers now secure their fire wood from the trimmings of trees and the thinning out here and there.

"Besides the fuel question, a clump of trees here and there add wonderfully to the appearance of the farm, make shelter for the stock and enhance the value of the farm as well as contributing to the beauty and attractiveness of the community."

We hope other project papers will pick up the good work of urging the planting of trees; that is the sole purpose of the articles appearing in the ERA on this subject.

### Helpful Suggestions

There is always a right and wrong way to accomplish anything. So-called shortcuts are not always the right way, although, usually, the right way saves time in the end.

Doing things in the right way becomes a habit, saves time and, therefore, tends to efficiency. I am sure there are many of us who have seen friends in our circle employ better methods in everyday tasks which we have been glad to use as an example, or probably we have found an easier and better way of doing these tasks and have been pleased to pass on our experiences to others.

How many times have you heard the inexperienced housekeeper confide the fact that everything in housekeeping

seems easy compared with laundering and folding a shirt, and yet this is one of the tasks that requires no particular skill.

### How to Fold a Shirt

When correctly folded, the shirt will retain its smooth, trim appearance after being put away with others in a drawer or on a shelf, and it can be packed for traveling with equal certainty that when taken out it will be fresh-looking.

### Reclamation Bureau Gets Medal of Honor

*At the close of the Sesquicentennial Exposition at Philadelphia, the Bureau of Reclamation was awarded the medal of honor for its exhibit. The awards to the department and bureaus were as follows: Grand prize: Department of the Interior. Medal of honor: Bureau of Reclamation, Bureau of Education, and Office of Indian Affairs. Gold medal: General Land Office, Geological Survey, National Park Service, and Alaskan Railroad. Silver medal: Bureau of Pensions.*

*The exhibit of the Bureau of Reclamation was simple but very effective, comprising a 7 by 9 foot model of an irrigated farm with a background of a number of colored enlarged photographs of project scenes, maps, and diagrams.*

Waists and dresses that are simply made can be folded in much the same way when necessary, but a better plan is to put them on hangers as soon as they are ironed, and store them in a closet that has a central pole for the purpose. All articles should be folded as little as possible, but this depends, of course, on the space available for storing them.

In general, fold pieces lengthwise in the direction of the warp and then very lightly crosswise until a convenient size is reached.

To fold a shirt or blouse, button it down the front and then lay it front side down on a table or board, making sure there are no wrinkles. The first folds are then made lengthwise, in such a way that the whole center front for about 5 inches each side of the middle will be kept smooth. The sleeves, by means of diagonal folds, are brought straight down the back

lengthwise. Parts of the two sleeves will overlap. In the case of a shirt there will be an end beyond the sleeves. This is turned back over the cuffs, and the shirt is folded across once more, leaving the front on the outside.

A little practice soon makes one adept at folding shirts so that they will all be the same size when finished and fit in the same drawer or box.

Laundries usually lay an oblong of cardboard of the desired width down the back before folding is begun, and fit the folds over that. If a few of these laundry eardboards are saved the home laundress can do the same thing. This extra protection from wrinkles is chiefly desirable if shirts are to be packed for traveling.

### Laundry Problems With Hard Water

If every home could have an abundance of perfectly pure water the home laundry problem would be greatly simplified. However, as found in its natural state water always contains more or less dissolved and suspended material.

Distillation is the best method of rendering water that is excessively alkaline, acid, or salty fit for use, but it is impractical in the home. Filtration and softening by means of boiling or by the addition of chemicals are the usual methods used in the household. The use of washing soda is an inexpensive method of treating hard water. One pound of soda is dissolved in 1 quart of water, and 2 tablespoons of this solution used for each gallon of water. Other chemicals may also be used. The greatest difficulty in using them is determining the quantity required by the degree of hardness of the water. This information can usually be obtained from the nearest water laboratory and if the trouble experienced is a permanent condition, it will be worth while to have a sample analyzed. Detailed information about treating hard and other waters to make them satisfactory for laundry purposes are given in a new bulletin on home laundering recently issued by the United States Department of Agriculture.

About 40 per cent of the average value of all the farm family's living is represented by food, one-third of which is purchased.

## Malnutrition in Spite of Plenty

The necessity for selecting the right food for children, and even for grown-ups, is being emphasized because in the midst of plenty, thousands are not getting the foods they need for the highest development of mind and body. The United States has more food and better food than any other nation. Our pure food laws and sanitary methods of handling food supplies are world famous. Along with our efforts to safeguard health through food control, however, we need to develop better food habits and so reduce our alarmingly high percentage of malnutrition.

An undernourished child does not have a fair start, and everything is harder for him. Even though his body may outgrow some of the visible signs of malnutrition others not so apparent remain. His resistance is likely to be lowered so that he "catches" diseases easily. Faulty mental habits cling and in countless other ways he carries a handicap all through life.

Research into the science of keeping well goes on but has not dictated the proportion of efficiency nor assumed the strides of progress enjoyed in other sciences.

Efforts toward the perfection of the body as an efficient working and thinking machine must of necessity be confined to improvements in its motive power; and since this is generated from the foods we eat, the remedy narrows down chiefly to what food we shall eat and how and when we shall eat it.

Building up the reserve by proper dietetic habits will make the individual practically immune to acute diseases. This means muscular and mental efficiency.

Give more thought to this all-important subject of fuel for the system and you will enjoy good health; while you are cutting out sickness you are laying a good foundation for this strenuous world's work and you are at the same time decreasing your doctor's and druggist's bills.

This takes on an economic aspect and has another important phase; those foods which are most conducive to efficiency and immunity to disease are the cheapest.

A suggested bill of fare, yielding 1,440 calories follows:

Tomato soup.	Bread.
Potatoes (white or sweet).	Butter.
Baked cauliflower.	Ripe olives.
Lima beans.	Pumpkin pie.
Spinach.	Cocoa.
Macaroni with cheese.	Walnuts.



Meets specifications in not being too fussy

This is equal in point of variety and palatableness to the more elaborate dinner, satisfies the appetite, and is more economical than the one which includes expensive cuts of meats, fritters, and indigestible foods of this kind.

### The Boy's Room

In the last issue of the ERA we carried a short article and a photograph of "The Girl's Room." Let us not forget another important adjunct of the home—"the boy."

A boy likes a room of his own, where he can bring other boys if he wishes. Straight lines, strong colors, durable materials, and few furnishings are desirable in such a room.

A boy won't want curtains with ruffles, pastel colors, or vague patterns. He

prefers such materials as burlap, crash, denim, or sateen, in strong green, brown, blue, or orange colors. These materials can be hung from a painted pole without a valance. Vigorous patterned cretonne should please him.

The illustration shows a young boy's room. The curtains are of gray gingham with colorful cretonne appliques. They match the couch cover. The material can be washed without losing its color, and it is simple enough to answer the boy's requirement that nothing in his room be "fussy." Many other satisfactory color combinations and materials could have been used.

The Forestry Council of Chautauqua County, New York, composed of representatives of all organizations in the county, has pledged itself to plant a half million trees in the county during the coming year.

# Outline of the Growth and Future of the Cooperative Movement

*On the Government reclamation projects the farmer learns by actual demonstration that what may be impossible to attain by an individual may be procured by an organization for the benefit of every individual*

*By Benjamin Brown, President, Utah Poultry Producers Cooperative Association*

COOPERATION or the cooperative movement is not new. Traces of it can be found even among animals who cooperate for the purpose of attack or protection from common enemies. Even wolves cooperate, forming packs in search of food. Early gatherings among men, first in families then into clans, tribes, etc., were in a sense voluntary cooperatives prompted by individual necessity. All through ancient and medieval history we find outbursts of cooperation as a means for the alleviation of some social ills. We also find cooperation in the early stages of our modern history. We find cooperation in the seventeenth century among European peasants forming cheese-making circles, which developed later into fairly good commodity marketing organizations. Those early European cooperative groups were the forerunners of the later ideological advocates for a world-wide cooperative movement as expressed by Robert Owen in his maxim, "The shop for the workers," etc. In the United States we have records of farmers' associations as early as 1825. Here in America the cooperative movement gained great impetus, under the leadership of Oliver Kelly in the early seventies of the last century, and with the appearance of the Rochdale Co-ops in England it seemed for a time as if the millennium was to be ushered in by a new redeemer riding on a White Horse called "Cooperation."

Strong and beautiful was that youthful rider. Dressed in a garb of peaceful blue, decorated with stainless white, guarded by the advance of justice and fair play to all, he made his way through the thickets of human selfishness and greed. But just as he was coming out of the thickets in one dark hour before dawn, during one of the desperate moments of doubt in his own strength, the bewitching coquette of party politics found our youthful cooperative captain and promising him a heaven of vanity, besmeared his clean garb with the stain of the party politician. Then, strangled under the weight of personal ambition, he fell into the gutter of momentary reward. Thus, the heroic rider on the White Horse, the cooperative movement of the last century, disappeared from our view until only recently his rejuvenated spirit, bathed and cleansed in the sorrows of the World War, made his reappearance again, revealing himself by reflection through the recent renewed cooperative movement the world over.

## POSTWAR PROGRESS

Before we go further it may be well to note down several facts and figures concerning this postwar cooperative movement. We find here in America where radical ideas usually travel slowly, that since 1922 when the American Farm Bureau Federation was formally established, the cooperative farm movement made enormous strides; 12,500 Co-ops, according to recent reports, had a turnover last year of two and one-half billion dollars. Also, whether the cooperative advocates care to be called radical or not, the fact is that the leaders of the cooperative movement in America are striving to establish conditions here similar to those in the little country of Denmark. In other words, the cooperative farm movement in this country has for its goal the object to eliminate any and all nonproductive elements from the present economic system. Again, it is an open secret that the farmers cooperative movement does not intend to stop with cooperative marketing alone, but seeks to derive similar benefits also through cooperative buying and distributing.

## COMING CHANGE IN ECONOMIC STATUS

Now, assuming that the above two features of the American cooperative movement; that is, cooperative marketing and cooperative buying, would become established facts with the majority of the American farmers, I can venture to predict a change all along the entire line of our present social and economic status.

First, because the above outline would naturally be followed by a federation of producer cooperatives of the same commodity. Second, this would most likely lead to the establishment of joint selling or distributing agencies for such federated cooperatives in the main distributing central markets. Third, the shipment of commodities to such central markets would be regulated by a central board of the federated organizations. This would mean an indirect price regulation for all markets alike on the same commodity, and if the above method of procedure was followed out for all food supplies and a raw material, which are produced by the various farmers' organizations, it would lead to an equal cost of living in all cities of the country.

Fourth, also, because of the great organized cooperative purchasing power

by this same federated farmers' organizations who would do cooperative buying on a large scale for their constituent organizations, there would be a less chance for some ambitious workers to become small manufacturers for themselves by trying to sell their wares to some country merchants who deal with farmers.

## OPPORTUNITY FOR COOPERATION ON PROJECTS

In conclusion, I want to say that the most effective schools for cooperation in America are the Government reclamation projects. Here the farmer learns by actual demonstration that what may be impossible to attain by an individual may be procured by an organization for the benefit of every individual. It is obvious that no individual can afford to build a reservoir and canal system for the purpose of irrigating his own farm. The United States Government, in building irrigation projects, not only supplies funds at a nominal rate of interest, but as I understand it, every individual is limited to a certain acreage under the project. In other words, no land and water speculation is permitted and every one pays the same amount per share, no matter how many shares he may want. There are no favorites under such projects. Again, the water users, under such projects, learn their first lessons of cooperation by submitting to the water master to divide the water among them as per their holdings of such water rights. They also learn the benefits of cooperative ownership of ditches and laterals, and of implements necessary for the cleansing and building of ditches and laterals, etc.

I know from personal experience on the Piute Reservoir project in Utah that it is much easier to explain the benefits of cooperation to a group of settlers on an irrigation project than to any other group of farmers. Here such farmers come in close and direct contact with technically trained Government officials, such as irrigation engineers and their assistants. The farmers usually listen to those men when they talk cooperation to them because they feel that inasmuch as the United States Government is in full accord with the cooperative idea it must be sound and it must be suited to American conditions because the cooperative plan fits the American principle of fairness to all and special privilege to none.

## When Irrigation Was Young

*Our readers will be interested in this article by a student of the history of irrigation and its relation to ancient civilizations—Many problems found to be similar to those on our irrigation projects to-day*

*By George O. Sanford, Superintendent, Sun River Project, Mont.*

MONTANA has been struggling with irrigation for something over two generations. The area now under the ditch is about 2,000,000 acres and the chief problem now confronting irrigation development is first to complete the projects that have been started and then secure the settlers who will bring these farms up to the highest possible state of cultivation.

Possibly you may think that we are trying to travel an unblazed trail in this irrigation work, but if you do think so you are mistaken for irrigation is one of the oldest arts practiced by the human race. In fact, the world was cradled under the ditch and the oldest known civilization was developed in countries where irrigation was necessary for the production of crops. Egypt was blessed with the annual overflow of the Nile, and because of this flood irrigation, supplemented by water stored in pools at the time the river was high, wonderful crops were produced. Herodotus tells us that the Egyptians—

Obtain the fruits of the field with less trouble than any other people in the world, since they have no need to break up the ground with the plough, nor to use the hoe, nor to do any of the work which the rest of mankind find necessary if they are to get a crop; but the husbandman waits till the river has, of its own accord, spread itself over the fields and withdrawn again to its bed, and then sows his plot of ground, after which he has only to await the harvest.

Good crops brought about a rapid increase in the population and a mighty nation grew up on the banks of the Nile which subjugated the adjoining nations and tribes and brought the captives back to till the soil and perform the hard tasks for their conquerors.

The Bible has frequent references to irrigation, and we read in Deuteronomy xi, 10, 11—

For the land, whither thou goest in to possess it, is not as the land of Egypt, from whence ye came out, where thou sowedst the seed, and wateredst it with thy foot, as a garden of herbs:

But the land, whither ye go to possess it, is a land of hills and valleys, and drinketh water of the rain of heaven.

It is self-evident that the promised land that Moses was talking about was a land where crops could be raised without irrigation, but one well may ask what is meant by watering the ground "with thy foot" for it certainly sounds like a

queer way to irrigate. In those countries the irrigation shovel was not a common tool, at least not as common as it is on the farms in this country and we have a right to assume that it was unknown in the time of Moses. The irrigation farmer in those days went barefoot, and when he wanted to turn the water from one plot into another, or from his farm ditch, what better way than to break down the bank with the foot and thus turn the water on to a new part of the farm? This same method is in use to-day just as it was several thousand years ago.

Babylon was the center of a large irrigated area, and we know from what little remains to-day that ages ago the country must have been covered with a network of canals.

One naturally wonders if there were engineers in those days who designed the canals and determined what the fall per mile should be and how much water each landowner was entitled to have. This we do know, that their canal systems were an important factor in the life of the nation and laws have been found which in some respects are in advance of the irrigation code of Montana. King Hammurabi ruled over Babylon about 4,000 years ago and he left inscribed on a large diorite boulder what is known as the code of Hammurabi the Just. These laws cover a great many subjects and among them is that of irrigation; and after reading them we draw the conclusion that the same troubles existed in those days that are found on all, or nearly all, of our projects at the present time. Here are some sections of his irrigation code:

If anyone is too lazy to keep his dikes in order and fails to do so, and if a breach is made in his dike and the fields have been flooded with water, the man in whose dike the breach was opened shall replace the grain which he has destroyed.

If he is not able to replace the grain he and his property shall be sold, and the people whose grain the water carried off shall share the proceeds.

If anyone opens his irrigation canals to let in water, but is careless and the water floods the field of his neighbor, he shall measure out grain to the latter in proportion to the yield of the neighboring field.

There can be no doubt that these laws were very effective in preventing carelessness in handling water, and some of us can recall the time when similar laws

would have had a very good influence in eliminating troubles on our present-day projects, although our ideas of right and justice would hardly permit the sale of a man to make good the destruction of crops.

It is evident that a king in those days had a good many affairs to which he had to give his personal attention and among others it seems that operation and maintenance work came under his supervision for we find letters written 40 centuries ago that read a good deal like the instructions of to-day. Letter writing in those days was quite an art, and, although it required a much longer time than it does to-day, the writings are still in perfect condition, which is something that may not be true of our letters 4,000 years hence. Clay cylinders were prepared on which were inscribed the cuneiform characters and then baked. The translation of these letters makes some very interesting reading. Here is one that Hammurabi wrote to one of his subordinates—possibly a superintendent in charge of some division of a project:

To Sin-Idinnam: Thus saith Hammurabi.

The whole canal was dug but it was not dug clear into Erech, so that water does not come into the city. Also the bank of the Duru Canal has fallen in. This labor is not too much for the people at thy command to do in three days. Directly upon receipt of this writing dig the canal with all the people at thy command clear into the city of Erech, within three days. As soon as thou hast dug the canal do the work which I have commanded thee.

In the art of letter writing we must admit that Hammurabi ranks high if the above quotation is a sample of his work. It is brief and to the point and there is a sound to it that does not permit any argument. It's a safe bet that the job in question was finished in three days.

The ancient records that have thus far been brought to light show that Hammurabi placed great importance on irrigation in connection with the economic life of his kingdom. One of the inscriptions reads as follows:

I have made the canal of Hammurabi, a blessing for the people of Shumer and Accad. I have made water flow in the dry channels and have given an unfailing supply to the people. I have changed desert plains into well-watered land. I have given them fertility and plenty, and made them the abode of happiness.



It will have to be admitted that this is a pretty good record and one of which a man, or even a king, may well be proud. And these few lines cover in a very thorough manner the objects to be obtained on any irrigation project; the establishment of homes where people can live in peace, prosperity, and happiness. Irrigation still has the same troubles that existed centuries ago. In those days it was a one-man proposition and from his decision there was no appeal. To-day these things must be considered and decided so as to give justice to all and the greatest good to the greatest number. The irrigation community must be a cooperative community if the best results are to be secured and that holds true from the operation of the canal system through the several operations to the disposal of the crop. "No man liveth unto himself alone." This thought is especially true on an irrigation project.

Cooperative organizations vary in type in accordance with marketing services performed, characteristics of the commodity handled, character of the trade with which they must articulate, extent and nature of the territory over which the association operates, and financial and social status of the members.

## Board of Examiners On Huntley Project

The Secretary has designated the following as members of a board to examine applicants for entry to public lands on the Huntley project, Montana:

H. M. Schilling, superintendent, Bureau of Reclamation, Ballantine, Mont.

J. Homer Hancock, secretary, Huntley project irrigation district, Ballantine, Mont.

Gregory J. Powell, president, Huntley project development association, Ballantine, Mont.

## Seed Potatoes Should Be Used Liberally

The importance of using a liberal quantity of seed potatoes is not generally recognized by commercial potato growers. The recent accomplishment of a firm of California potato growers in producing 1,038.3 bushels of potatoes on a measured acre and an average yield of 1,001 bushels on 9 acres would not have been possible if only the usual quantity of seed had been planted. These growers consider the liberal use of seed a good investment. In the production of their phenomenal yield

seed potatoes were planted at the rate of 40 bushels per acre or more than twice the quantity used by our most progressive potato growers.

Experimental results indicate there is a close correlation between the quantity of seed used and the yield per acre. Planting large-size sets insures a better germination and a larger set of tubers; therefore it is a desirable practice provided the resultant plants have an abundant supply of plant food and moisture. Large-size sets mean more stems and tubers per set; consequently more nourishment is needed to develop these tubers to market size.

**T**WO cars of dressed turkeys were shipped in December from the Garland division of the Shoshone project. The price paid was the highest in the history of the project and brought returns amounting to about \$30,000.

**T**HE Powell Creamery, Shoshone project, purchased during December, 12,500 pounds of butterfat, and manufactured 15,000 pounds of butter and 100 gallons of ice cream. Other agencies purchased 4,700 pounds, shipping to outside creameries. The Frannie division shipped 7,600 pounds of cream, of which 3,200 pounds went to the Powell Creamery.



Orchards on the Okanogan project, Washington



## Cotton Growing on the Orland Project

By R. C. E. Weber, Superintendent

**C**OTTON was first raised on the Orland project during 1918, at which time two experimental plots of 10 acres each were planted. The results as to yield were fairly satisfactory, but no further attempt was made in cotton culture until 1925, when 64 acres were devoted to this crop on the project.

Upon the recommendation of the United States Department of Agriculture, based on observations and experiments during previous years in the San Joaquin Valley of California, the Acala variety was planted at Orland. The yields derived have proven the wisdom of the recommendation of specializing in this variety for the Orland project as well as for the Sacramento Valley in general. The Acala variety is a "short-staple" cotton with a fiber of  $1\frac{1}{8}$  to  $1\frac{3}{16}$  inches in length. The results of the plantings for 1925 were so uniformly satisfactory that the acreage expanded to 279 during the past season.

Results for the past season and for 1925 indicate about the same yield per acre. Much lower prices, however, for 1926 resulted in a reduced crop value per acre. The large variation in price to which the product is subject casts considerable doubt on its being ranked as a staple product of the project.

On the 64 acres cropped during 1925, there were produced 50 bales of cotton, representing an acreage yield of 0.78 bales per acre, which at \$112.50 per 500-pound bale, resulted in a total crop value of \$5,625, or \$87.90 per acre. During the present year 225 bales were raised on 279 acres. This represents an average yield of 0.81 bale per acre, a slight increase over the yield for last year. Opposed to the 1925 price of \$112.50, however, was the early offering last fall of only \$67.50 per bale, nearly a 50 per cent reduction. Based on the above price of \$67.50 per 500-pound bale, last season's crop is valued at \$15,187, representing an average return of \$54.43 per acre.

Cotton is planted in April and during the early part of May. A moist seed bed, usually obtained by irrigation, is desirable. The seed is drilled in rows about  $3\frac{1}{2}$  feet apart to permit ready cultivation during the growing season. About four irrigations (exclusive of that for preparing the seed bed) were required during last year to mature the plant. Land properly prepared for irrigation so that the water supply can be uniformly applied is essential for the best results in raising cotton. Picking began during the latter part of September and most of the

crop was harvested at the close of October. A small amount was in the field for picking during November.

A number of items of expense are involved in cotton culture. In addition to the cost of planting, irrigating, and cultivating, there are expenditures for picking and ginning. Picking costs from  $1\frac{1}{2}$  to 2 cents per pound (unginned cotton). This results in  $4\frac{1}{2}$  to 6 cents per pound for the ginned product. Ginning, together with charges for ties and baling, amounts to  $1\frac{1}{2}$  cents per pound (ginned cotton), which, however, is slightly more than compensated for by the value of cottonseed. Farmers were paid about \$1.12 per hundredweight for the seed at the gin. The ratio of seed to ginned cotton by weight is about 2 to 1, the percentages being 62 and 38, respectively, of the raw product.

In 1925 it was necessary for the Orland cotton growers to take their product to Maxwell (33 miles distant) for ginning. Last year, however, a gin was operating at Hamilton City, 12 miles east of Orland.

The cotton produced on the project is sold by the farmers to buyers who consign the product to market. No effort has yet been made by the local growers to organize and operate a cooperative marketing organization for disposing of the product.

Crop rotation is a farm practice which may be used by the farmer to increase the productivity of his soils as effectively as by the use of manure or commercial fertilizers.



1. Picking cotton. 2. Cotton raised on the project. 3. Cotton gin at Hamilton, near the project. 4. Ginned and baled cotton.

## Organization Activities and Project Visitors

**D**R. ELWOOD MEAD, Commissioner of Reclamation, spent several days recently in southern Florida considering opportunities for planned group settlement in that State.

R. F. Walter, chief engineer, arrived at the Washington office early in January for a stay of several weeks in connection with appropriations and the construction program.

B. E. Hayden, reclamation economist, will be in the Washington office for a month or two assisting in the preparation of booklets advertising the Belle Fourche, Lower Yellowstone, Riverton, Shoshone, Klamath, and Orland projects.

The representatives of the Interior Department and of private interests, appointed by the Secretary and comprising R. S. Carbery, L. M. Holt, of the Indian Bureau, and P. J. Preston, superintendent of the Yuma project, after completing a three months' field investigation of private and Government projects, was in the Denver office practically the entire month of December, compiling a report on operation and maintenance methods and costs.

Mary Christian, assistant clerk in the Denver office, has been transferred to the office of the Federal prohibition agent at St. Louis, Mo. Grace Miller has been appointed to succeed Miss Christian by reinstatement and transfer from the National Park Service.

Messrs. Howard Elliott, Daniel C. Roper, and George Soule, special advisers on reclamation and rural development, visited Wilmington, N. C., recently to inspect the group settlement on the property of Hugh MacRae. The report of the special advisers covering their trip in December through the South to study opportunities for planned rural development will be submitted shortly to the Secretary.

Roland Harwell, manager El Paso County water improvement district No. 1; J. W. Taylor, president and manager, Elephant Butte irrigation district; and Maj. R. F. Burges, attorney for the two districts, were recent visitors at the Washington office to confer concerning a possible revision of the present contract with these districts on the Rio Grande project.

Recent visitors to the Yuma project were Governor George H. Dern, Dr. John A. Widtsoe, William R. Wallace, and Oliver J. Grimes, of Utah, accompanied by the board of directors of the Imperial irrigation district.

Lorenzo Lepori, civil engineer from the Argentine Republic, spent two days on the Orland project inspecting the irrigation works at Orland and East Park, and the construction at Stony Gorge.

W. G. Steward, formerly with the Bureau of Reclamation and now hydraulic engineer with the Twin Falls Canal Co., Idaho, spent two days on the Minidoka project to obtain information on ground-water conditions.

District Counsel Roddis was in Great Falls during December, in company with Superintendent Sanford of the Sun River project, for a conference in connection with land purchases in Gibson Reservoir and matters relating to the hearing on the confirmation of the execution of the contract by the Fort Shaw irrigation district.

Recent visitors at Guernsey Dam, North Platte project, included William Ernst, chemist of the South Dakota Cement Commission; O. H. Cox, of the Bureau of Standards; and H. M. Lawler, of the Utah Construction Co.

After finishing his assignment on the investigation of Spanish Springs, A. W. Walker returned to the Newlands project to assume charge of drainage work.

L. E. Foster, superintendent of the Carlsbad project and Assistant Engineer J. R. Yates spent several days at Las Vegas attending the hearing of the Pecos River adjudication suit.

R. S. Besse, farm management specialist of the Oregon Agricultural College, was on the Klamath project recently collecting statistics on crop yields and values for lands in the main division. The information obtained will be one of the items in the agricultural survey of Klamath County, which is now in progress under the supervision of the college.

E. Stacey, locating engineer for the Oregon Short Line Railroad, was a recent visitor on the Owyhee project.

D. B. Pratt, field manager of the Utah-Idaho Sugar Co., was on the Belle Fourche project the greater part of December in connection with plans for the construction of a sugar factory.

Ed. Makeben, of the Squire-Dingee Pickle Co., made a recent visit to the Belle Fourche project to inspect the salting stations and make plans for an extension of the industry.

L. E. Mayhall, general superintendent of hatcheries for the State of Washington, and J. M. Mayhall visited the Kittitas division of the Yakima project to discuss the matter of fishway provision in the design of the proposed dam at Easton.

Clifford L. Tice, reservoir superintendent at Tieton Dam, Yakima project, has been transferred to a similar position at McKay Dam, Umatilla project.

Associate Engineer J. R. Iakisch was on the Shoshone project for several days in connection with the Garland division drainage matters, coming from the Vale project, Oregon, and going to the Denver office.

Kirk Bryan, geologist, United States Geological Survey, arrived at Carlsbad on January 24 to make the geologic examination of the Avalon Reservoir site.

Ottamer Hamele has resigned as counsel in the Bureau of Reclamation to take a position on the trial staff of the general counsel of the Bureau of Internal Revenue.

A cooperative association is not a profit-making institution, but rather a service institution through which the producers seek to control in varying degrees the processes involved in the distribution of the products produced on their farms.

The successful operation of a cooperative association over a period of years is dependent upon members who support their organization with an adequate supply of products.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

George C. Kreutzer, Director of Reclamation Economics

P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	W. L. Vernon.....	B. E. Stoutemyer.....	El Paso, Tex.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	Montrose, Colo.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Billings, Mont.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	M. M. Wilson.....	E. E. Roddis.....	Do.
King Hill <sup>2</sup> .....	King Hill, Idaho.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Klamath.....	Klamath Falls, Oreg.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Billings, Mont.
Lower Yellowstone.....	Savage, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	Do.
Milk River.....	Malta, Mont.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Minidoka <sup>3</sup> .....	Burley, Idaho.....	D. S. Stuver.....	O. B. Snow.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
Newlands <sup>4</sup> .....	Fallon, Nev.....	H. W. Bashore.....	L. H. Mong.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
North Platte <sup>5</sup> .....	Mitchell, Nebr.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Oreg.
Okanogan.....	Okanogan, Wash.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Orland.....	Orland, Calif.....	F. A. Banks.....	V. G. Evans.....	L. S. Kennicott.....	B. E. Stoutemyer.....	Portland, Oreg.
Owyhee.....	American Falls, Idaho.....	L. M. Lawson.....	R. B. Smith.....	R. B. Smith.....	H. J. S. Devries.....	El Paso, Tex.
Rio Grande.....	El Paso, Tex.....	H. D. Comstock.....	W. F. Sha.....	Mrs. O. C. Knights.....	Wm. J. Burke.....	Mitchell, Nebr.
Riverton.....	Riverton, Wyo.....	L. H. Mitchell.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Billings, Mont.
Salt River <sup>6</sup> .....	Powell, Ariz.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Shoshone <sup>7</sup> .....	Provo, Utah.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Strawberry Valley <sup>8</sup> .....	Fairfield, Mont.....	R. J. Newell.....	R. K. Cunningham.....	J. C. Oawler.....	B. E. Stoutemyer.....	Portland, Oreg.
Sun River.....	Hermiston, Oreg.....	J. L. Lytel.....	M. J. Gorman.....	E. M. Philebaum.....	do.....	Do.
Umatilla <sup>9</sup> .....	Montrose, Colo.....	P. J. Preston.....			R. J. Coffey.....	Berkeley, Calif.
Uncompahgre.....	Boise, Idaho.....					
Vale.....	Yakima, Wash.....					
Yakima.....	Yakima, Ariz.....					
Yuma.....						

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>10</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>10</sup> .....	Chas. Klingman.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>11</sup> .....	E. R. Mills.....		B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gibson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>11</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Dam site, Elk Creek, Calif.....	H. J. Gault <sup>11</sup> .....	C. B. Funk.....		R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on April 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.  
<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1926.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

<sup>10</sup> Resident engineer.

<sup>11</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise.....	Boise, Idaho.....	R. J. Newell.....	
Middle Rio Grande.....	Denver, Colo.....	I. E. Honk.....	Middle Rio Grande conservancy district.
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	State of Utah.
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	State of Wyoming.
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



An irrigation scene on the Uncompahgre project, Colorado



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# NEW RECLAMATION ERA

VOL. 18

MARCH, 1927

NO. 3



AN IRRIGATED APPLE ORCHARD ON THE OKANOGAN PROJECT, WASHINGTON



*IN speaking of the business operations of the Federal Government we are not greatly concerned with the amount of responsibility attaching to an office. Rather are we concerned with the manner in which that responsibility is discharged. It is in the discharge of our duties that we find success or failure. In the vast business of the Federal Government we must necessarily measure the product in the aggregate. This aggregate is the sum total of all of our efforts. No matter how high or how low the position held, each of us in the Federal service contributes to the aggregate of the product. We are often charged with inefficiency. But I am fully convinced that the facts demonstrate that, measuring efficiency by the aggregate of the product these last years, there is no business body more efficient than the business organization of the Federal Government.*

*—From the address of the President of the United States at the  
Twelfth Regular Meeting of the Business Organization  
of the Government, January 29, 1927.*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

MARCH, 1927

No. 3

## Interesting High Lights on the Reclamation Projects

**T**HE Colorado River discharge at Yuma during January was about 48 per cent of the 24-year average. Cold weather in the upper watershed held the discharge below 7,000 second-feet during the month.

**A**VERAGE returns from heavy shipments of lettuce from the Yuma project, less the crates, were about \$1.10 a crate, bringing the growers about 40 cents. The average yield was about 200 crates an acre.

**E**XCAVATION for the abutments of the Stony Gorge Dam, Orland project, was carried on actively during January. One cableway had been installed and was ready for operation, and works had started on panel forms for the dam and in the installation of the gravel and concrete plant.

**T**HE Orland Orange Growers Association have packed and shipped 25 cars of oranges during the current season. The results of the season's operations will be highly remunerative to the growers, indicating a bright future for this industry on the project.

**T**HE sixth annual show of the Western Colorado Poultry Association was held recently at Delta, Uncompahgre project. Approximately 600 birds, valued at \$5,000, were exhibited.

**T**HE Montana State Corn Show and the Montana Utility Seed Show held recently at Sidney, Lower Yellowstone project, gave the water users an excellent opportunity to see the best products in these lines produced in the State and to hear a number of instructive talks. Several water users received high awards on their entries.

**T**HE State Poultry Show held recently in Caldwell, Boise project, gave evidence of increased interest in this industry on the project. The Caldwell hatchery will operate on an enlarged scale and others are being started.

### Project Crops Worth \$60,000,000 in 1926

*Crops valued at more than \$60,000,000 were grown last year on the Federal irrigation projects under the Bureau of Reclamation.*

*According to advance figures prepared by the bureau, 1,409,932 acres were irrigated on 24 irrigation projects. Of this area, which included land in young alfalfa and in nonbearing orchards, 1,311,405 acres were cropped, producing crops having a gross value of \$60,331,245, or \$46 per acre.*

*In contrast to this figure of \$46 per acre on the Federal irrigation projects it is interesting to note that the average value per acre in 1926 of 10 principal crops, comprising nearly 90 per cent of the area in all field crops for the United States as a whole, is estimated by the Department of Agriculture at \$19.07.*

**F**IVE additional applications have been received for farm units on the River-ton project, and six applicants visited the project during January. Three applicants were accepted by the examining board.

**T**HE Powell Creamery, Shoshone project, purchased 10,300 pounds of butterfat during January, manufacturing 12,400 pounds of butter. Other agencies purchased 4,600 pounds of butterfat. Cream shipments from the Frannie division totaled 1,000 gallons, of which 40 per cent went to Powell.

**J**ANUARY business of the Mini-Cassia Dairyman's Association, Minidoka project, was the largest in the history of the organization. Daily receipts of 2,000 pounds of butterfat were recorded.

**A**N organization known as the Minidoka Purebred Association, with capital stock of \$25,000, has been incorporated on the Minidoka project. The purpose of the new company is to market to farmers on the project purebred stock, especially hogs, dairy cows, and sheep.

**R**OCK foundations for Gibson Dam, Sun River project, have been opened up along the upper end of the south abutment for a distance of about 200 feet. Work has been started on excavating the cut-off trench at the upstream toe of the dam for that portion of the south abutment already uncovered.

**M**ANY inquiries are being received concerning the opening to entry of 145 farm units on the Tule Lake division of the Klamath project. The units are being opened on a rental basis and include an area of about 8,000 acres.

**T**HE Great Northern and the Northern Pacific Railroads have begun their advertising campaign of opportunities for the purchase of land under option on the Lower Yellowstone project, one company reporting the receipt of 250 inquiries.

**T**HE Utah-Idaho Sugar Co. has begun the construction of a new sugar factory at Belle Fourche. The beet spur to Vale has been located, with prospects that construction will begin with the opening of spring.

## Commissioner Mead Urges Action on Colorado River Development

*"There is no reason why the Nation should not favor early action on the Swing-Johnson measure, as its provision for entire repayment of the cost relieves the general taxpayer of any financial burden, present or prospective"*

ASSERTING that the growing menace from floods on the Colorado River makes the construction of the proposed Boulder Dam an imperative necessity, Commissioner Elwood Mead, of the Bureau of Reclamation, recently urged early action in placing the Swing-Johnson bill before the House of Representatives in a letter to Chairman Addison T. Smith, of the House Committee on Irrigation and Reclamation.

The commissioner pointed out that recent appeals have been made to the bureau for investigations and advice regarding emergency measures for protection against floods on the river next summer and that engineers conducting surveys during the past two or three months agree that Imperial Valley is menaced by a disaster of dramatic proportions. All these engineers, he stated, agree that a reservoir large enough to hold back the floods and increase the low-water flow is necessary and that levees are only a temporary makeshift. The letter in full follows:

HON. ADDISON T. SMITH,  
Chairman Committee on Irrigation  
and Reclamation,  
House of Representatives, United  
States, Washington, D. C.

DEAR MR. SMITH: My long and intimate contact with the farmers of Yuma and Imperial Valleys and my knowledge of their struggle to protect their farms and homes from being destroyed by Colorado River floods leads me to express the hope that early action may be taken in placing the Swing-Johnson bill before the House of Representatives.

The growing menace to the levees which now hold the river out of these valleys has led recently to appeals to this bureau for investigations and advice regarding emergency measures for protection from the floods of next summer. These valleys have been visited and reports made within the last two or three months by Colonel Jackson, of the United States Engineer Corps, by R. M. Priest, engineer, United States Reclamation Bureau, and Prof. Frank Adams, of the University of California. They are in agreement that the Imperial Valley is menaced by a disaster of dramatic proportions.

All agree that a reservoir large enough to hold back floods and increase the low-water flow is an imperative necessity. Levees are a temporary makeshift. The river runs along the rim of the Imperial Valley Basin. It is building up its channel through the deposit of the 100,000 acre-feet of silt carried down yearly by its sediment-laden waters. This means that levees must be raised higher and higher, with greater cost to maintain an increasing danger of failure. A break at a critical point may easily cause the loss of all that has been built up by 20 years of sacrifice

and arduous effort. Only less serious is the recurring danger of drought during August and September. The loss of crops in one year has reached the staggering total of \$6,000,000.

There is no reason why the Nation should not favor early action on this measure. Its provision for entire repayment of the cost relieves the general taxpayer of any financial burden, present or prospective. The stupendous dam will regulate the river. The All-American Canal to carry the water to Imperial Valley will end a vexatious and costly conflict with Mexico over international water rights.

The Government has been drawn into this great enterprise because no private company has offered to assume the risk and incur the expense of building the dam and related irrigation works, and no private company could adequately deal with interstate and international water rights, provide domestic water for the needs of cities, protect the rights of existing irrigators, and construct works for the irrigation of new areas. These complex factors make this a national enterprise in the truest sense.

It is fortunate, therefore, that building the dam creates great power possibilities. Without the revenue to be obtained from the sale of power at the switchboard, or the lease of the power privilege, this project would entail a burden of many millions of dollars on the taxpayers of the whole country. The power possibilities ought to be utilized and the revenue therefrom

ought to be used to help pay for the works. The bill is so drawn that contracts to furnish the needed revenue must be signed before construction begins. It is a unique, safe, solvent, businesslike scheme.

The act is so drawn that the Secretary of the Interior is not required to build the power plant. He can lease the power privilege to private companies or municipalities who would erect their generating works, or he can build a power house and lease it with the water to those who would install electric machinery. These alternatives for dealing with the power opportunity are necessary in order to enable the Secretary to bargain to advantage. If he is deprived of authority to invite alternative proposals, I am convinced that competition will be restricted and the result will be an unworkable measure because of lack of revenue.

While the bill as drawn, embodies the Colorado River compact and is conditioned on ratification by six States of that compact, such condition is not essential to the accomplishment of the purposes of the bill. If these States do not desire to ratify, it is entirely within the power of Congress to provide for the protection of the upper States by subjecting this development to the terms of the compact in so far as it gives to those States the prior right to 7,500,000 acre-feet of water each year.

If these works are built, I favor such reservation of power to the different States of the lower basin as will assure them of cheap power for the development of their industries, but I am not in favor of power reservations that will enable them to levy toll on revenue due the Government and needed to repay construction costs. Until the entire investment of the Government has been repaid, all the revenue, whether from power sold at the switchboard of a Government plant or from water leases to private works, should go to the Federal Government. After that has been done, then the Government may properly consider who should be the beneficiaries of profits from the operation of these works, but an attempt to allocate now any part of the revenue from irrigation, sale of water for domestic purposes, or from power to anyone outside of the Government will, I fear, make financing the enterprise impossible.

If this bill is brought before the House, its discussion will educate the public as to the urgent necessities of the imperiled sections of the Southwest and as to the economic value of the latent resources which it will bring into use.

Sincerely yours,  
ELWOOD MEAD, Commissioner.

### Reclamation Policies Approved by Institute

Approval of the new Federal reclamation policies is contained in resolutions recently adopted at a conference of the Washington Irrigation Institute held at Seattle. The resolutions in full follow:

Whereas the Department of the Interior and its Bureau of Reclamation, after a careful investigation by a fact-finding commission and otherwise, have adopted a policy for future reclamation, under the Federal reclamation act as amended, based upon feasibility and necessity, which program provides that in undertaking new projects a program of settlement and development shall be included with the program for construction and that new projects shall be undertaken only after full investigation and approval of the Department of the Interior, and

Whereas it is believed that the adoption of such policy will result in the most orderly and most successful development of our remaining arable arid lands, which may be developed under this act: Therefore be it

Resolved, That the Washington Irrigation Institute approves this policy and program of the Department of the Interior.

About one third of our dairy cows are being kept at a loss, one third yield little or no profit, and the profits of the dairy business come almost altogether from the other third.

# Southern Reclamation Conference Plans for Future Development

*Enthusiastic meeting of representatives from eight Southern States held in Interior Department Building plans for increased appropriations to continue work of investigation of opportunities for planned rural development*

**E**IGHT Southern States were represented at a Southern Reclamation Conference held on February 8 in the auditorium of the Interior Department Building to discuss planned rural development and the reclamation of neglected lands in the South by creating more attractive and prosperous farm life.

The meeting was opened at 3 p. m. by David R. Coker, of Hartsville, S. C., as presiding officer. Hon. Hubert Work, Secretary of the Interior, gave the address of welcome to the delegates, referring to the work already accomplished by the recent trip through the South of the special advisers on reclamation and rural development to investigate typical properties selected by State officials in each of the six States of North and South Carolina, Georgia, Alabama, Mississippi, and Tennessee. The Secretary was especially happy in his remarks and left no doubt in the minds of the delegates that he is thoroughly in sympathy with the proposed work and fully alive to the latent possibilities of planned rural development throughout the South.

Hugh MacRae, of Wilmington, gave a comprehensive outline of the purpose of the conference, stressing particularly the large amount of agricultural products which the South finds it necessary to import. He was followed by Dr. Elwood Mead, Commissioner of Reclamation, who spoke at length on the human side of reclamation, drawing a parallel between what the Bureau of Reclamation is doing on the reclamation projects of the West under the new policy and what must be done in any similar development in the South if the settlers are to have a reasonable assurance of success.

Dr. W. W. Long, director of Clemson College, S. C., then gave an interesting discussion of the effect of reclamation on Southern agriculture. Doctor Long spoke of the present agricultural conditions, the need of new people whose agricultural environment has been based on livestock and a diversified agriculture, the necessity of amending the national immigration law, why colonies have failed in the South, why community settlement should be encouraged, why the State and Federal Governments cooperating should undertake and control the first settlements, why some office or department of the State government should have administrative responsibility, and how the original settlements can be financed. In

conclusion he pointed out that our future is likely to be determined by the relation of the people to the land and that we have not yet learned what the older countries of the world already know, that keeping people on the land must be one of the main endeavors of civilized nations.

George C. Kreutzer, director of reclamation economics, then spoke on recent improvements in financial and economic conditions on reclamation projects, using the Belle Fourche and Lower Yellowstone projects as examples of the application of the new policy of reclamation in making it possible for settlers to succeed. He was followed by Hugh A. Brown, chief of the division of settlement and economic operations, who gave some of his impressions of the recent southern trip by the special advisers on reclamation and rural development, supplemented by colored lantern slides illustrating the work of the Bureau of Reclamation from the standpoint of construction and development.

L. J. Folse, general manager of the Mississippi State Board of Development, closed the afternoon meeting with a characteristically enthusiastic address, calling attention to the opportunity afforded to the delegates of bringing to a successful conclusion the auspicious start already made.

In the evening the delegates, Members of Congress, and representatives of the Bureau of Reclamation attended a banquet at the Washington Hotel, followed by a large number of addresses by delegates and Members of Congress in support of the proposed work. Hugh MacRae, of Wilmington, acted as toastmaster. One hundred and fourteen men and women attended the banquet, including 8 Senators and 41 Congressmen.

After the banquet the committees from the Southern States held a meeting and appointed Rutledge Smith, general agent of the Tennessee Central Railway, of Nashville, Tenn., to put in concrete form the proposal for increasing the appropriation for surveys to be made by the Bureau of Reclamation as preliminary to the establishment on one demonstration project in each State to a total sum of \$65,000 and to place this information before certain Senators and Congressmen.

It was decided that the several committees attending the conference from the Southern States should elect a State chairman and enlarge each State com-

mittee to the number of 20, selecting leading men who are interested in the question of improving southern agricultural conditions through a reclamation program as outlined at the afternoon conference. The meeting elected Hugh MacRae as chairman of the associated southern committees for the current year.

A list of those attending the banquet follows:

## WASHINGTON, D. C.

E. C. Finney, First Assistant Secretary of the Interior.  
Elwood Mead, Commissioner, Bureau of Reclamation.  
George C. Kreutzer, director of reclamation economics.  
P. W. Dent, assistant to the Commissioner, Bureau of Reclamation.  
Charles A. Bissell, chief of engineering division, Bureau of Reclamation.  
Hugh A. Brown, chief, division of settlement and economic operations, Bureau of Reclamation.  
Copley Amory.  
John M. Hager, Department of Commerce  
J. J. Skinner, Department of Agriculture.  
W. E. Price, general immigration agent, Southern Railway.  
Oswald Skinner.  
Mrs. Elwood Mead.  
Mrs. George C. Kreutzer.  
Mrs. Copley Amory.

## ALABAMA

Lister Hill, Member of Congress, second district (Montgomery).  
Henry B. Steagall, Member of Congress, third district (Ozark).  
Lamar Jeffers, Member of Congress, fourth district (Anniston).  
M. C. Allgood, Member of Congress, seventh district (Allgood).  
Ed B. Almon, Member of Congress, eighth district (Tusculum).  
George Huddleston, Member of Congress, ninth district (Birmingham).  
William B. Bankhead, Member of Congress, tenth district (Jasper).  
R. E. Seibels, Montgomery.  
Bruce Beveridge, Selma.  
F. T. Raiford, editor, Times-Journal, Selma.  
H. H. Frasier, secretary chamber of commerce, Selma.  
G. M. White, Mobile.

## FLORIDA

Park Trammell, United States Senator.  
Herbert J. Drane, Member of Congress, first district (Lakeland).  
R. A. Green, Member of Congress, second district (Starke).  
W. J. Sears, Member of Congress, fourth district (Kissimmee).

## GEORGIA

William J. Harris, United States Senator.  
Walter F. George, United States Senator.  
Charles G. Edwards, Member of Congress, first district (Savannah).  
E. E. Cox, Member of Congress, second district (Camilla).  
W. C. Wright, Member of Congress, fourth district (Newnan).  
W. D. Upshaw, Member of Congress, fifth district (Atlanta).

S. Rutherford, Member of Congress, sixth district (Forsyth).  
 C. H. Brand, Member of Congress, eighth district (Athens).  
 W. W. Larsen, Member of Congress, twelfth district (Dublin).  
 J. M. Patterson, Albany.  
 Roland Turner, general agricultural agent, Southern Railway, Atlanta.  
 J. F. Jackson, general agricultural agent, Central of Georgia Railway, Savannah.  
 W. R. Neal, Savannah.  
 P. J. Brown, Albany.  
 Mrs. Paul J. Brown, Albany.

## LOUISIANA

Bolivar E. Kemp, Member of Congress, sixth district (Amite).

## MISSISSIPPI

Pat Harrison, United States Senator.  
 H. D. Stephens, United States Senator.  
 J. E. Rankin, Member of Congress, first district (Tupelo).  
 B. G. Lowrey, Member of Congress, second district (Blue Mountain).  
 W. M. Whittington, Member of Congress, third district (Greenwood).  
 Jeff Busby, Member of Congress, fourth district (Houston).  
 Ross A. Collins, Member of Congress, fifth district (Meridian).  
 T. Webber Wilson, Member of Congress, sixth district (Laurel).  
 J. W. Collier, Member of Congress, eighth district (Vicksburg).  
 L. J. Folse, general manager Mississippi State Board of Development, Jackson.  
 B. E. Eaton, Gulfport.  
 G. M. McWilliams, Hattiesburg.  
 T. S. Jackson, secretary chamber of commerce, Hattiesburg.  
 Holt E. Ross.  
 Ben M. Stevens, Richton.  
 R. B. McLeod.  
 H. J. Schwietest.  
 P. G. Jones.  
 B. M. Walker.  
 A. D. Simpson.

## NORTH CAROLINA

Charles L. Abernethy, Member of Congress, third district (New Bern).  
 H. L. Lyon, Member of Congress, sixth district (Whiteville).  
 Wm. C. Hammer, Member of Congress, seventh district (Asheboro).  
 Zebulon Weaver, Member of Congress, tenth district (Asheville).  
 Hugh MacRae, Wilmington.  
 Jonathan Daniels.  
 Geo. A. Grimsley, Winston-Salem.  
 Chas. A. Flynn, Washington.  
 Guy A. Cardwell, agricultural and industrial agent, Atlantic Coast Line Railway, Wilmington.  
 J. W. Morton, Wilmington.  
 Nelson MacRae, Wilmington.

## SOUTH CAROLINA

E. D. Smith, United States Senator.  
 Thos. S. McMillan, Member of Congress, first district (Charleston).  
 Butler B. Hare, Member of Congress, second district (Saluda).  
 John J. McSwain, Member of Congress, fourth district (Greenville).  
 W. F. Stevenson, Member of Congress, fifth district (Cheraw).  
 A. H. Gasque, Member of Congress, sixth district (Florence).  
 J. Campbell Bissell, Charleston.  
 W. P. Whelpley, Charleston.  
 P. F. McElwee, Charleston.  
 Thomas P. Stoney, mayor, Charleston.  
 David R. Coker, Hartsville.

# Reclamation Conference at Denver

March 16-18, 1927

A CONFERENCE of superintendents, district counsel, and others, including members from the Washington and Denver offices of the Bureau of Reclamation, will be held at the Denver office beginning at 9 a. m. March 16, 1927, and closing at 4.30 p. m. on March 18, 1927.

The purpose of this conference is to discuss the problems before the bureau in order to bring about more uniform and efficient methods and a better understanding of recently enacted legislation.

## Tentative Program

### FIRST DAY, MARCH 16

#### GENERAL

Introductory, Dr. Hubert Work, Secretary of the Interior

Progress of reclamation during the past year and future problems, Dr. Elwood Mead, Commissioner

#### CONSTRUCTION AND OPERATION AND MAINTENANCE

Mr. Walter, chief engineer, chairman

1. Résumé of work in progress during 1927 and proposed with 1928 appropriations ..... R. F. Walter.
2. Investigation of new projects..... E. B. Deblor.
3. Allotments and authorities..... L. R. Smith.
4. Submission of data for design and estimates..... W. H. Nalder.
5. Transfer of equipment and supplies..... S. O. Harper.
6. Personnel and civil-service regulations..... G. A. Bonnett.
7. Problems of the field..... H. D. Comstock.
8. Discussion of operation and maintenance report as prepared by the special committee..... P. J. Preston.
9. Discussion, questions, and answers.

Daniel C. Roper, former Commissioner of Internal Revenue.  
 R. E. Hanna, Cheraw.  
 Chas. E. Ivay, Clinton.  
 J. F. Jacobs, Clinton.  
 Morris Fass, president Coastal South Carolina Agricultural Development and Industrial Association, Dillon.  
 A. B. Jordan, Dillon.  
 H. K. Gilbert, Florence.  
 W. H. Daniel, Mullins.  
 Thos. S. Wilbur, Charleston.  
 W. M. Frampton, secretary Agricultural Society of South Carolina, Charleston.

### TENNESSEE

Kenneth McKellar, United States Senator.  
 Lawrence D. Tyson, United States Senator.  
 S. D. McReynolds, Member of Congress, third district (Chattanooga).  
 Cordell Hull, Member of Congress, fourth district (Carthage).  
 E. L. Davis, Member of Congress, fifth district (Tulahoma).

### SECOND DAY, MARCH 17

#### LEGAL AND FINANCIAL

Mr. Dent, assistant to the commissioner, chairman

1. Recent legislation..... P. W. Dent.
2. Contracts with irrigation districts..... B. E. Stoutemyer.
3. Advertisement and specifications (new forms)..... A. Offutt.
4. Operations under the fact finders' act of Dec. 5, 1924..... W. J. Burke.
5. Operations under the adjustment act of May 25, 1926..... J. R. Alexander.
6. Accounting requirements..... W. F. Kubach.
7. Application of credits under subsections I and J, act of Dec. 5, 1924..... E. B. Darlington.
8. Collections and obligations..... J. L. Lytel.
9. Obligations of irrigation districts and water users' associations on transferred projects. P. W. Dent.
10. Preparation of cost and returns reports and appropriation estimates for Budget..... W. F. Kubach.
11. Discussion, questions, and answers.

### THIRD DAY, MARCH 18

#### SETTLEMENT AND FARM DEVELOPMENT

Mr. Kreutzer, director of reclamation economics, chairman

Introductory by Doctor Mead

1. Settlement and farm development problems..... G. C. Kreutzer.
2. Plans for settlement of the Bella Fourche project..... F. C. Youngblutt.
3. Subdivision and exchange of land at Badger Pocket..... W. R. Young.
4. Exchange of entries on Shoshone project..... L. H. Mitchell.
5. Adjustment of classes 5 and 6 land under act May 25, 1926. H. H. Johnson.
6. Crop census to determine average gross incomes under crop repayment contracts..... G. G. Sanford.
7. Appraisal and value of land on new projects..... B. E. Hayden.
8. Discussion, questions, and answers.

Joseph W. Byrns, Member of Congress, sixth district (Nashville).  
 Gordon Browning, Member of Congress, eighth district (Huntingdon).  
 Finis J. Garrett, Member of Congress, ninth district (Dresden).  
 Hubert F. Fisher, Member of Congress, tenth district (Memphis).  
 Rutledge Smith, general agent Tennessee Central Railway.  
 J. A. McNeill, traffic manager, Tennessee Central Railway.  
 Frank W. Lewis.

### PRESS REPRESENTATIVES

Richard Woods Edmonds, Manufacturers Record, Baltimore, Md.  
 David F. St. Clair, Greensboro News, North Carolina.  
 Russell Kent, Washington correspondent, Birmingham News, Montgomery Advertiser, Knoxville Journal.  
 Hubert Holloway, North Carolina, representing H. E. C. Bryant, the Charlotte Observer, the Asheville Citizen, the Wilmington Star.



## Necessity for Making Payments Greatest Blessing, Says Manager

(From the Hermiston (Oreg.) Herald)

ONE of the chief needs of the Hermiston district is fewer tenant-operated farms and more owner-operated farms, according to the opinion expressed by Enos D. Martin, project manager. His opinion was based on a study of crop returns and his observation of farming operations.

"The paternal policy of the Government has made it possible for absentee landlordism, or tenant operation of farms, to continue," Mr. Martin said, but he expressed the belief that farm operation in the future on the project is destined to shift more and more from the hands of tenants to those of the owner.

Mr. Martin said:

Under the policy that was followed by the Government for a number of years in the matter of not requiring payment of

operation and maintenance and construction charges from landowners the absent owners were willing to rent their places for what they could get. Under the supplemental contract between the district and the Government charges must be paid, and owners must of necessity get more revenue from their places, dig up the charges out of their pockets, or face the alternative of losing their places.

Tenant farming on some kinds of land in certain types of farming is fairly satisfactory, but as a general proposition on irrigated land, particularly with the soil we have here, it results in the farm being run down rapidly and marks a decrease in its productive capacity. I know personally of a number of farmers who are renting as many as five or six or more small acreages.

To operate so much irrigated land in separate acreages to advantage is simply a physical impossibility. Usually water is turned in at irrigating time and allowed

to run where it will. Damage to the land and ditches and inadequate irrigation follow, with the result that at hay-harvest time only patches will be worth cutting. The tenant gets half of what he thinks will pay to harvest, and the owner gets his half. In the future the owner must have more if he is to continue to own the land.

The necessity of meeting water payments will result in better farming operations on the project with some changes in ownership, which will mean that the new owners will take over operation of their own land and bring it up to the level of production now maintained on the average owner-operated farm.

"Shoestring" operations have also been responsible for lack of success on the part of some settlers, and as this type of ownership of farm land decreases and is replaced by those who have sufficient equities in their lands to make success easier the percentage of failures will be even less.

The necessity of making payments is bound to be one of the biggest blessings we could have on the project, in my opinion. Land banks and others holding mortgages have made it plain that they will protect their mortgages by paying charges if the present owners do not, so the ultimate result promises to be greater stability of both values and production after the adjustment has been made than we have ever enjoyed.

## Mrs. E. F. Van Hise Finds Turkeys Pay

Mrs. E. F. Van Hise, who lives west of Paul on the Minidoka project, Idaho, decided to raise turkeys in a small way last year. She kept a strict account of her expenses and income and is convinced that a farmer's wife can find no more profitable side line than that of turkey raising.

Starting last spring with 6 turkey hens, Mrs. Van Hise raised 115 birds. Of these she sold 46 to the Thanksgiving trade and 32 at Christmas time and received in cash the sum of \$412.34. Nearly \$50 more was received for birds sold for breeding purposes:

Mrs. Van Hise also had 48 White Leghorn hens, and her records show that they not only paid in eggs for their keep but also bought the turkey feed.

Mrs. Van Hise writes that last year was the first year of her life spent on a farm. Her motto is well worth quoting: "If you want a thing, go after it and you can get it."

If the dairy herd is culled intelligently on the basis of individual cow records, if the remainder are fed according to known production, and if only good purebred sires are used, almost any dairy herd, regardless of its condition at the start, will eventually be placed on a paying basis.



A few of the turkeys raised by Mrs. Van Hise

## Construction Type of Echo Storage Dam

The first division of the Salt Lake Basin irrigation project, Utah, comprises the construction of the Echo Storage Dam and Reservoir on the Weber River and a diversion canal from Weber River to Provo River, at an estimated cost of \$3,000,000.

Under present plans the main body of the Echo Dam will consist of a natural mixture of clay, sand, and gravel placed in horizontal layers, moistened and compacted by rolling in accordance with the

best modern practice for this type of embankment. The downstream portion of the dam will be reinforced by a heavy toe of rock fill and with a heavy blanket of gravel over the entire downstream face. The upstream face will be protected by a layer of heavy riprap 4 feet thick. The top of the embankment will be protected by a reinforced concrete parapet wall, and the net freeboard above the high-water surface in the reservoir will be 13 feet. Impervious construction will be carried below the natural foundation surface to a water-tight closure with the underlying bedrock.

# Recent Improvements in Financial and Economic Conditions on Reclamation Projects<sup>1</sup>

By George C. Kreutzer, Director of Reclamation Economics

**L**AST year at a meeting of representatives from many of the western railroads and others interested the problems of some of the reclamation projects were discussed. It was the purpose of those attending to work out plans of improving their financial and economic conditions.

## THE BELLE FOURCHE PROJECT

The Belle Fourche project in South Dakota furnished an illustration of a project having a large number of non-resident owners and with this a large delinquency in water payments and delayed farm development. When this project was settled, any citizen who had not used his homestead right could secure a farm. Many of the owners were living in distant cities and were making their incomes from occupations widely separated from farm life. They were leasing their farms to resident owners who, in many instances, already had more land than they could cultivate. On such leased farms farm buildings were dilapidated and fields were weedy. Yields were low, and the rents were in many cases less than taxes.

## DEVELOPMENT AT A STANDSTILL

In 1925, 17 years after water first became available, only 31 per cent of the

project was cultivated by resident owners. The remaining land was owned by non-residents or mortgage companies and banks, and water payments were not being made. State and county taxes were in default, industries were at a standstill, and people were leaving the project instead of new settlers coming in; yet the project had fertile soil, an abundance of cheap water, and a climate that favored the production of high-priced crops.

The settlers and the Government had come to the crossroads. If the financial and economic conditions of this project could not be improved, then it would be better to abandon it and lose a large portion, if not all, of the \$4,000,000 that had been invested in irrigation works rather than to risk additional funds for operating to await good times. Moratoria had previously been granted, but the improved conditions to meet the Government's debt had not arrived. On the other hand, if a constructive program could be worked out and the morale of settlers strengthened the investments of the Government and settlers could be saved and a community of home owners established that would be an asset to the State and Nation.

<sup>1</sup> Address delivered at Southern Reclamation Conference, Washington, D. C., Feb. 8, 1927.

## NEW PROGRAM ADOPTED

The program outlined last year with some modifications was adopted. Options in favor of the Government were obtained on 95 farms which were more or less uncultivated or unoccupied. The prices and selling terms are controlled for three years. In addition, agreement was reached with the State banking department and those administering the State rural credit act and school lands to sell 70 farms owned or controlled by these institutions at reasonable prices and on liberal terms. Thus 165 farms were made available for sale at prices varying from \$12.50 to \$108 an acre.

The farms offered for option were appraised by an independent committee, who through years of experience understood land values and local farming conditions. The appraisal committee took the view that nothing but real farm opportunities should be offered to settlers. If the price asked by the owner was less than or equal to the appraised value, an option was taken. If he wanted more than the appraised value and could not be induced to reduce his price, an option was not taken. A uniform land-selling contract was worked out. This included the following:

(a) Settlers to make an initial payment of 10 per cent in cash at time of purchase.



Oats and sugar beets in irrigated rotation, Belle Fourche project, South Dakota

(b) For the next two years only simple interest at the rate of 6 per cent to be charged.

(c) The remainder of purchase price to be repaid in 36 semiannual amortized payments with interest at 6 per cent.

(d) Settlers who purchase unimproved farms to effect improvements to the value of 25 per cent of the purchase price in the first two years, one-half of this in the first year.

(e) Settlers to insure and keep insured all insurable improvements in the name of the landowner and the purchaser as their interests appear.

(f) Settlers to apply for a Federal land bank loan when requested to do so by the owner and pay off the remainder of the purchase price owing.

These purchasing terms permit settlers of small means to use a large portion of their capital to improve farms and buy livestock and also provide that farms may be purchased out of farm income.

The fixing of land prices and liberal repayment terms are two important steps in any settlement plan.

The next step was to arrange for cooperative advertising and take care of new settlers.

The Belle Fourche Chamber of Commerce issued a general illustrated folder describing the locality. The Bureau of Reclamation is publishing a booklet giving authentic information on the project and the farms for sale. A paragraph is given in the booklet to the description of each farm, showing its area, character of

soil, kind of house and outbuildings, fences, amount in alfalfa, area prepared for irrigation, distance from school, town and shipping point, and finally its sale price, initial deposit, and half-yearly payment. Each of these are definite opportunities and will appeal to prospective settlers.

An agent of the bureau is being assigned to this project to assist new settlers in selecting farms suited to their capital, helpers in family, and character of farming desired. He is a practical irrigator and understands the rotation of crops and the kind that should be planted. He will know where good dairy cows and sheep can be bought, as well as other stock and farm equipment. After settlement he will assist new settlers with their financial and economic programs. He will have his hand on the settler's shoulder to give him encouragement and will see that capital goes into those farm enterprises which will insure income.

The advertising will be done by the railroads and other interested agencies. It will consist of liner ads in farm journals and by solicitation.

#### AMAZING RESULTS FOLLOW

The program has been in effect for a short time only, but the results are amazing. The water users paid \$12,000 in 1926 in excess of the amount required under their contract. The Utah-Idaho Sugar Co. is expending \$1,500,000 for the erection of a new sugar refinery at Belle Fourche; the State is expending \$125,000

to gravel arterial highways to transport sugar beets from farms to beet dumps; Butte County is expending \$75,000 to gravel feeders to the arterial highways for the same purpose. The Squire-Dingee Co., of Chicago, is enlarging its facilities to handle cucumber pickles and is expending \$75,000. This will provide the largest pickle-receiving station in the world. Congress appropriated \$125,000 to begin the construction of a complete drainage system. This will relieve all lands at present seeped or waterlogged. It is the beginning of a million-dollar drainage program. The Chicago and North Western Railroad Co. will expend \$500,000 in the extension of spurs for transporting beets to factories. The total amount that will be spent within the next year or 18 months in this locality will approximate two and one-half million dollars. A year ago none of the institutions making these improvements felt they could risk their capital. The morale of farmers was low and the future was uncertain. No promise of the construction of a sugar factory could be obtained. The railroad did not feel like expending money for beet spurs unless they knew that farmers were coming in to grow this high-priced crop. This program has had its effect on securing settlers. The secretary of the irrigation district advises that in round numbers 100 additional families will come to the project for the 1927 cropping season. Part of them have already arrived. Hardly a day passes without the arrival of a carload of livestock, farming equipment, furni-



A well-developed home on the Belle Fourche project, South Dakota

ture, and other possessions of land seekers. One day several such cars arrived. The sugar company has secured contracts from farmers for more than 8,000 acres of sugar beets to be grown in 1927. Previously the largest area grown in any year was 3,000 acres.

All of this points favorably to the payment in full and on time of all current water charges due the Government. Everyone expects to pay and plans accordingly.

This program is cumbersome because the bureau has not the authority to supply some of the essentials to a modern colonization plan. No provision has been made for credit to complete the development of farms or to prepare land for irrigation before settlement. Fortunately many of the farms have houses, barns, other outbuildings, and fences and have an area already sown to alfalfa. Farmers who buy these will largely overcome the lack of these facilities which would otherwise be needed.

#### THE LOWER YELLOWSTONE PROJECT

What has been and is taking place on the Belle Fourche project is being repeated on the Lower Yellowstone project in Montana. Eight thousand acres have been secured under options on this project. The same form of uniform selling contract has been adopted, and a booklet is being issued describing the farms for sale.

The Great Northern and Northern Pacific Railroad Cos. are already advertising in 30 farm journals, and, while these ads have only been running a few weeks, the Great Northern Railroad has received 250 inquiries and is urging us for a supply of the booklet so proper information may be sent to these people. Likewise, the Northern Pacific is receiving inquiries in large numbers. The chamber of commerce of Sidney, Mont., is engaging a man to personally solicit skilled irrigators who understand the growing of sugar beets and other high-priced crops.

A new contract was made with this project last year. In 1926 they paid the full operation and maintenance charge and the amount required on construction. It is the first time they have done so, even though water has been available for 18 years. The contract provides for the establishment of a revolving fund to buy tax titles. The collections already made show that more has been raised for this purpose than was required for the first year. Collections of irrigation assessments are likewise satisfactory.

#### ORGANIZATION AND TEAMWORK WIN

What is taking place on these projects can be accomplished on any project where the cost of water is reasonable and where

the soil and climatic conditions favor the growing of profitable crops. These basic economic factors for successful development have not been changed at Belle Fourche and Lower Yellowstone, but organization and teamwork put them to their highest use. Projects, as is the case with other communities, succeed on carefully worked-out programs vigorously backed and put into effect by all concerned.

### Tule Lake Lands Open to Entry

*Public notice has been issued by the Secretary of the Interior announcing the opening to entry on March 1, 1927, of 145 public-land farm units in the Tule Lake Division of the Klamath irrigation project, Oregon-California.*

*The division will be operated on a water-rental basis until its agricultural development has advanced sufficiently to permit a district organization, at which time a so-called joint liability contract will be required, as provided for in section 45 of the act of May 25, 1926, and the construction charge will be announced at \$88.35 per acre, payable over a 40-year period. Should the water users fail or refuse to organize a district and enter into the contract, it will be necessary to issue public notice under the extension act of August 13, 1914, without regard to the write-off under the recent adjustment act and under a 20-year repayment plan. This would result in a construction charge of \$100.55 per acre payable in 20 years.*

*Under the present public notice water will be furnished for each of the irrigation seasons of 1927 and 1928 at \$1.85 an acre for each irrigable acre in the farm unit, which will entitle the entryman to 2 acre-feet of water per acre. Additional water will be furnished at the rate of 75 cents per acre-foot. The irrigable area of the farm units averages about 50 acres. Ex-service men have a preference right of entry, but selection of applicants will be made by an examining board on approved qualifications of industry, experience, character, and capital, of which the applicant must have at least \$2,000 or its equivalent in livestock, farming equipment, or other assets.*

*Additional information concerning the opening may be obtained from the superintendent of the Klamath irrigation project, Klamath Falls, Oreg., or from the Commissioner, Bureau of Reclamation, Washington, D. C.*

## Sugar-Beet Production on the Projects

Advance statistics compiled by the Bureau of Reclamation show that last year sugar beets were grown on 62,407 acres on 11 Federal irrigation projects, producing 614,386 tons, valued at \$4,619,233, or \$74 per acre.

The largest acreage, yield, and value appeared on the North Platte project in Nebraska and Wyoming, where nearly 33,000 acres produced 347,000 tons, valued at \$2,663,000, or \$81.11 per acre. The highest value per acre, amounting to \$94.83, was on the Belle Fourche project, South Dakota. The average yield per acre for the 11 projects amounted to 9.8 tons, with the highest average yield of 11.5 tons on the Belle Fourche project. Complete statistics for the 11 projects are given in the accompanying table.

*Sugar beets on irrigation projects, 1926*

Project	Acreage	Yield		Value	
		Total tons	Per acre tons	Total	Per acre
Grand Valley, Colo.	1,536	12,644	8.2	\$94,830	\$61.74
Uncompahgre, Colo.	3,575	32,824	9.2	229,938	64.31
Minidoka, Idaho.	1,865	9,519	5.1	57,078	30.60
Huntley, Mont.	4,767	52,744	11.06	448,324	94.04
Milk River, Mont.	2,816	23,970	8.5	155,805	55.32
Sun River, Mont.	114	1,507	9.2	8,456	74.17
Lower Yellowstone, Mont.-N. Dak.	5,180	50,286	9.7	301,716	58.25
North Platte, Nebr.-Wyo.	32,837	347,230	10.5	2,663,390	81.11
Belle Fourche, S. Dak.	2,184	25,104	11.5	207,108	94.83
Strawberry Valley, Utah	3,820	19,592	5.1	117,552	30.77
Shoshone, Wyo.	3,713	39,416	10.6	335,036	90.23
Total.....	62,407	614,386	9.8	4,619,233	74.02

THE State Extension Service held a three-day Farm Economic Conference for Irrigated Land at Sidney, Lower Yellowstone project, early in February. Questions discussed included cultural methods, varieties of crops, preparation of land, sugar beets, potatoes, livestock feeding, and other pertinent subjects. It is expected that the printed reports, based on recommendations of various commodity committees, will be of great value to new settlers in assisting them to get started on the right program.

In many dairy herds the profits of the highest producers just about offset the losses of the lowest producers.

Intelligent selection of dairy animals is the first step in building up a high-producing herd.



## Canadian Soldier Settlement Act

*From International Review of Agricultural Economics*

THE following extracts from an article in the *International Review of Agricultural Economics*, January-March, 1926, by H. P. Desjardins, secretary to the Assistant Deputy Minister of Agriculture, Canada, will be of interest to those who are studying the question of aided and directed settlement in the United States.

The soldier land settlement act of 1917, as amended in July, 1919, gave the land settlement board of three commissioners power to grant a loan to every eligible soldier settler possessing sufficient capital to supply the needs of his family until the next harvest and to pay a first installment amounting to at least one-tenth of the purchase price of the land. The loans that might be granted were divided into three categories:

### FINANCIAL AID

1. For eligible settlers buying their farms through the commission:

(a) A maximum of \$4,500 for the purchase of land;

(b) A maximum of \$2,000 for the purchase of stock, plows, or other implements;

(c) A maximum of \$1,000 for buildings and other permanent improvements.

2. For eligible settlers established on Federal lands in the western Provinces:

A maximum of \$3,000 for the purchase of livestock and implements, for buildings and other permanent improvements; in this case the total advanced was determined by the guarantees which the settler could furnish.

3. For eligible settlers already possessing arable land:

(a) A maximum of \$3,500 for the payment of mortgages; but the sum advanced for this purpose could not exceed half the estimated value of the farm;

(b) A maximum of \$2,000 for the purchase of livestock, plows, and other implements;

(c) A maximum of \$1,000 for buildings and other permanent improvements.

The total of the possible loans to settlers belonging to this last category could not exceed \$5,000.

### RESULTS

Up to December 31, 1924, the number of soldiers settled on the land was 30,604, and the number of loans granted 24,148, representing a total sum of \$103,150,098.73, of which \$59,800,229.35 was utilized for the purchase of land, \$2,559,259.71 for the paying off of mortgages on farms, the private property of soldier settlers, \$10,608,979.67 in payment of permanent improvements effected, \$29,782,430.69 for the purchase of stock and plowing implements, and \$399,199.31 disbursed to Indian settlers through the department of Indian affairs.

Of the 24,148 settlers to whom loans were granted, 4,229 are established on public Federal lands, 2,463 on private properties, and 17,456 on lands purchased.

The average loan to soldiers is about \$2,266 in each case.

The total sum advanced is guaranteed by a first mortgage on 4,219,439 acres of land; in addition 1,549,440 acres were sold by the Federal Government, on which no advance was made, making the total area granted in virtue of the law 5,768,879 acres.

In the course of the fiscal year 1923-24 a total sum of \$3,195,209.91 was received by way of repayments of money lent, exclusive of the first ready money payments made in respect of sales effected in the course of this financial year. From January 1, 1924, to November 30 of the same year the sum derived from the same source amounted to \$2,331,458.69.

Altogether 727 settlers have completely cleared their debts; of these, 336 have sub-

sequently ceased farming, leaving a total of 391 settlers at present working on their farms.

### RESULTS OF NONSELECTION OF SETTLERS

The number of farms abandoned since the act began to work is 5,203; that is, 21.5 per cent of the whole; out of this number 1,863 have been or are about to be resold, leaving a total of 3,340 farms unsold, that is, 13.8 per cent. The causes for abandonment are numerous and include death, bad health, and other causes beyond control. A good number result from the reappearance of disabilities, the results of war service. It would, however, appear that a number of cases of abandonment may be ascribed to lack of aptitude, instability of character or temperament either on the part of the soldier settler or of his wife. (Note: Apparently much of this could have been obviated by proper selection of settlers in the first place.—*Editor*.)

Successful dairying depends on many factors. Among these, culling is one of the most important. The most successful dairymen closely cull their herds.

Keeping feed records and weighing and testing the milk regularly make it possible to determine the production of your cows with a high degree of accuracy.

## Southern Work Indorsed by Railway Association

At a recent meeting of the Railway Development Association of the Southeast, the following resolution was adopted:

Whereas the Interior Department of the United States, through its Bureau of Reclamation, has recently sent to the South under authorization by Congress, a capable committee to investigate the farm settlement possibilities of this region, and the result of said investigation is to be the subject of a report to Congress: Be it

*Resolved*, That the Railway Development Association of the Southeast does hereby most heartily indorse the purpose of the investigation and pledge the support of our members in aiding in every way that we possibly can such further efforts as the Congress of the United States may authorize the Bureau of Reclamation to make in inaugurating in the Southern States the establishment of some supervised and properly planned farm settlements which shall serve as a demonstration of the best possible methods for aiding the development of the South through helping to establish upon the land a farming population of successful, prosperous, and contented farm owners.

## South African Engineers Appreciate Bureau Aid

Commissioner Mead has received the following letter of appreciation from Mr. S. B. Shannon, of the irrigation department of the South African Government, who, in company with Mr. N. Shand, of the same department, visited recently a number of the irrigation projects under the Bureau of Reclamation:

On the eve of our return to South Africa, on behalf of Mr. Shand and myself, I wish to thank you and the Reclamation Service for the kindly interest and the practical assistance which have made our trip so interesting and, from our point of view, so great a success.

The numbers of engineers we have met, the varieties of views expressed, and the underlying spirit of optimism and keenness met with everywhere have proved tremendously stimulating. We are returning to South Africa filled with a new energy and enthusiasm for engineering. There we hope to put our experience to practical use.

Thank you again for the great opportunity which you placed in our way.



## Tenth Annual Glenn County Fair, Orland, California

*Throughout its ten years of existence the Glenn County Fair has established the record of being designated as one of the most successful and best managed county fairs in California*

*By R. C. E. Weber, Superintendent, Orland Project*

THE tenth annual Glenn County Fair was held at Orland, Calif., during the week of September 20 to 25, 1926, inclusive. The inception of the Glenn County Fair dates back to the fall of 1916, at which time a number of stock owners in the vicinity of Orland assembled a collection of livestock for stock-judging purposes. This gave birth to the idea of an annual fair, with the result that an organization, entitled The Glenn County Livestock and Agricultural Association and duly organized under the laws of California, was formed. In the following fall of 1917 the First Annual Glenn County Fair was held, which has been followed by an exhibition each succeeding year.

The fair has been uniformly successful throughout the period of years that it has been in existence. Twelve acres of ground within the incorporated limits of Orland have been acquired with the original capital and the surplus of each year's operations. Permanent improvements, consisting mostly of fencing, livestock pens, and other minor structures, have been erected on the grounds. Trees planted in the first year of the fair's existence now add to both the attractiveness and the utility of the grounds. Throughout its 10 years of existence the Glenn County Fair has established the record of being designated as one of the most successful and best managed county fairs in California.

### ONE-FAMILY FARM EXHIBIT

Probably one of the predominating, and doubtless the most instructive, features of this year's fair was the one-family-farm exhibit, displaying agricultural products raised on a single farm. It was required that all products exhibited be grown in 1926 by members of the family exhibiting them and upon the farm occupied by them. There were three entries in this class of exhibits, two exhibitors being owners of farms within the project and the third displaying products from a farm immediately adjoining the project area but deriving its water supply from a well. First prize was awarded to the latter, the second and third premiums going to the two project farms. The ratings of the three exhibits were so close that a fraction of 1 per cent in the judges' ratings determined the relative standings. The variety of products exhibited—all raised on the same



Prize-winning display of one-family farm exhibits

farm—was amazing. More than 50 different products from a 40-acre farm were exhibited in the display of E. J. Guilford, a comparatively newcomer to the Orland project. Included in the one-family-farm exhibits were fruits, both fresh and canned, vegetables of all varieties, field crops, nuts, honey, root crops, flowers, and seeds. This is the first year that the plan of the one-family-farm display has been tried out, and the interest aroused, together with the favorable comment on the pioneer exhibits at the tenth annual fair, predicts a larger list of entries and keener competition in succeeding years. That the pioneer exhibit at this year's fair is the beginning of a new line of fair displays is manifested by the fact that the California National Bank, of Sacramento, Calif., has announced a magnificent trophy during 1927 for the best one-family-farm exhibit shown at any of the county fairs throughout California.

### COUNTY EXHIBITS

The general county exhibits were grouped in an attractive manner, displaying to best advantage the array of products from the soil and forcefully indicating the agricultural resources and the progressive development of the county. The floricultural department occupied a prominent place near the

entrance to the main tent, with an attractive exhibit of pines, a bordering circle of cypress, and an abundance of flowers and potted plants. The horticultural division displayed a large variety of fruits, in which citrus products from the Orland community were prominently featured. The display of agricultural crops, both field and garden, although not up to the standard of some of the previous fairs, nevertheless demonstrated to the visitor, through the surprisingly large variety of products displayed, what may be brought forth from Glenn County soil when intelligent farming methods are applied. The farm center exhibits, which on the occasion of many previous fairs had been the centers of attraction, were again in evidence but not to the extent of prior years. The Codora center, coming nearly 30 miles from the extreme southeastern part of the county to exhibit its display, was awarded the blue ribbon in the farm center display contest. A booth prepared by the Willows Chamber of Commerce and displaying products—industrial as well as agricultural—of the area contiguous to the county seat was one of the best, as well as one of the most interesting, exhibits of the fair.

### LIVESTOCK

The livestock department was not lacking in high-class, purebred animals.

The famous Aberdeen-Angus show cattle of the Harrison Stock Farms, of Woodland and Kirkwood, Calif., were on exhibition. It is said that no herd of black cattle in America has such a large aggregation of prize-winning bulls and cows as this collection. Blackcap Revolution, grand champion of the 1925 Chicago International Livestock Show, is probably the most famous animal in the herd. Prize-winning Duroc-Jersey hogs at this year's State fair in Sacramento were also on exhibit at the Glenn County Fair by the Harrison Stock Farms. The purebred Jersey herd of Edna L. Knight, numbering 30 prize winners of both California and Oregon State fairs, was a center of attraction for admirers of Jersey cattle as well as the recipient of many first awards. The entries of Holstein cattle were numerous, the herd of J. N. Cook, an Orland project landowner, receiving most of the premiums awarded this breed of cattle. In the swine department, Durocs, Poland-Chinas, Chester-Whites, and Berkshires were entered. Both the poultry and sheep departments were well represented by entries of various fowls and the standard lines of sheep.

#### STONY GORGE DAM DISPLAY

The Orland Unit Water Users' Association, in collaboration with the project office of the Bureau of Reclamation, prepared a display devoted principally to the Stony Gorge supplemental construction of the Orland project. A large drawing showed the Stony Creek watershed and the location of the Stony Gorge Reservoir with relation to the project area and the existing storage works at East Park. Another drawing exhibited plans and designs of the Stony Gorge Dam. The secretary of the association, assisted by the president and directors, together with employees of the project office, was in constant attendance to answer inquiries of interested visitors.

#### AMUSEMENT FEATURES

The amusement features of the fair were many and varied. Centrone's Military Band of 20 pieces, coming direct from the Philadelphia Sesquicentennial Exposition, rendered two concerts daily during the six days of the fair. Gypsy and Marta, Pacific coast wide-renowned radio artists from station KPO of San Francisco, were present in person and delightfully entertained twice daily during three days with musical numbers. An open-air dancing platform with music by a five-piece orchestra was crowded to capacity every evening. A fashion show, displaying the latest foreign creations in feminine apparel, brought cross country from New

York via airplane, was the center of attraction during the evening allotted to it on the program of events. The "Zone," appealing to the popular fancy, was occupied by the Foley and Burke Carnival Shows. One evening of the week was given over to a boxing tournament.

All exhibits, except livestock and poultry (for which permanent sheds are provided), were sheltered under an immense tent 150 by 350 feet in size. The entertainment features of the fair were held in a smaller tent with a seating capacity of 1,200. The "Zone" occupied an outdoor area of approximately 3 acres.

#### GLENN COUNTY SCHOOL DAY

The event drawing the largest attendance was the parade of school children on September 21, officially designated as

### Yakima Farmers Spend \$2,950,000 for Autos

*The Yakima Daily Republic states in a recent issue that every fifth family in the Yakima Valley, Wash., bought a new automobile during the past year. The article is as follows:*

*"What price prosperity? Yakima residents have been inclined to grumble a bit at the fates during the past year, because some of them failed to sell potatoes at the peak price; others did not get what they anticipated for their apple crop; and still others found their year's return in business endeavors below that for which they had hoped. But, admitting that the year was not a period of marked boom, no less than 2,950 new automobiles were purchased from valley dealers during the period. That represents one new auto for every five families, a better showing in new machines alone than many districts can make when all automobiles, including those of truly revered and ancient history, are considered. And even with that heavy investment in new cars, bank deposits in the city of Yakima increased a quarter million in the year."*

*Assuming a value of \$1,000 for each of the 2,950 automobiles sold, we have the rather tidy sum of \$2,950,000 spent for automobiles. Out of the 350,000 acres under irrigation in the valley the Bureau of Reclamation is supplying water to about 140,000 acres and the Indian Service to about 80,000 acres, so it is evident the greater part of these machines were purchased by farmers living on Government projects.*

Glenn County School Day. Classes in all schools throughout the county were suspended for the day and the children formed a large parade, in which about 3,000 pupils and four bands (three of which were school organizations) participated. Historical pageants, based on events in American history, were illustrated by various schools.

Indicative of the magnitude of operations involved in connection with the fair are the total expenditures for this year's exhibition, approximating \$15,000. Sufficient revenues, notwithstanding gate receipts of \$1,000 less than those for the previous year, were derived, so that the fair again paid its way and continued its past record of financial success. Its larger and broader usefulness and value, however, lie in the medium which it affords for fostering and promoting cooperative and friendly competitive effort. Better agricultural products and higher-grade livestock result from the competition manifested in the displays of farm products and in the exhibition of livestock. The spirit of neighborliness and getting better acquainted, which is encouraged by attendance at the fair, is not without its compensating value.

#### ALL THE RESULT OF IRRIGATION.

It is well within the realm of fact to state that irrigation alone has made possible the annual Glenn County Fair. Before the advent of extensive and intensive irrigation the farm products of the county consisted almost exclusively of grain, which was grown year after year until a considerable part of the land had become so impoverished in fertility that it would yield a profitable crop only on alternate years and following a season's rest. It remained for irrigation to bring forth from this depleted soil diversified farm products, which were followed by the introduction of high-class livestock, all of which are essentially necessary for a successful county fair. In this connection the Bureau of Reclamation has played no small part through the instrumentality of the construction and operation of the Orland project.

NEW settlers who leased farms on the Belle Fourche project have begun to arrive with their stock and equipment. Immigrant cars unloading at Newell and Nisland indicate a definite trend to the unoccupied farms in contrast to the situation that has existed for the past five years. Although nearly all farms with habitable buildings have been rented, the demand continues, and a movement is on foot to create a credit corporation for the construction of farm buildings.



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



### Suggestions for Lightening the Farm Woman's Work



Caring for floors

**F**INISHED floors can be kept in good condition with a comparatively small outlay of time and strength, but the method must be adapted to the kind of finish. A string or cloth dust mop, such as is shown in the illustration, is almost a necessity in the home where the floors are varnished, waxed, oiled, or painted. A cotton flannel bag may be drawn over the broom to serve the same purpose, but is not so convenient.

When the surface of the floor that is not covered by rugs is merely dusty, such a mop enables one to go over it quickly and easily. The mop should not be saturated with oil, but may be slightly moistened with floor oil or kerosene unless the floor is waxed. If it is necessary to give a floor a good oiling, another mop or woolen cloth should be used and kept especially for the purpose.

In general, varnished floors retain their color and luster better if no water is used on them, but if very dirty they may be wiped with a cloth or mop wrung out of warm soapy water, wiped dry at once, and polished with an oiled cloth or mop.

Waxed floors should be swept with a soft brush or mop entirely free from oil. Oil softens wax and should never be used on it in any way. When a waxed floor becomes dull and grimy it should be given a more thorough cleaning with a cloth wrung out of warm soapy water or, better

still, moistened with turpentine or gasoline. Both turpentine and gasoline are very inflammable, however, and should not be used in a room where there is an open flame of any kind. After the waxed floor is cleaned, rub on a new thin coating of wax and polish with a weighted brush or a woolen cloth.

Oiled floors should be swept with a soft brush and dusted with an oiled cloth or mop. They may be cleaned occasionally with a cloth wrung out of warm soapy water and then polished with a cloth moistened with kerosene or a good floor oil. Excess of oil should be avoided. Water and soap should be used very sparingly on oiled floors. Similar treatment is used for painted floors.

### Home-Grown Vitamins

When you lay out your garden this spring be sure to allow for plenty of fresh vegetables for the table during the summer, as well as some for canning and some to store for winter use. Two vegetables other than potatoes should be served every day, according to nutrition specialists, to supply an abundance of vitamins in the diet. A salad of raw vegetables or lettuce and fruit may be counted as one of these vegetables, and if taken in addition to the other two vegetables suggested it increases still further the chance that sufficient vitamins are being provided.

Plant the garden with one eye on the menus. Certain crops like snap beans,

(Continued on page 45)



The "kitchen garden"

## Hawaiian Reclamation Project on the Island of Molokai

*During the past four years 116 families have been located on the island. Plans are now under way to organize a cooperative association to market farm products*

*By E. E. Foville, Chairman, Agricultural Committee, and member Land Settlement Committee, Portland Chamber of Commerce, Portland, Oreg.*

**D**URING a recent visit to the Hawaiian Islands, America's western frontier, the writer upon the invitation of Gov. Wallace Farrington, visited the island of Molokai to study at first hand the reclamation project now being carried on under the direction of the "Hawaiian Homes Commission."

The object of the Hawaiian rehabilitation act of 1920 was to put back on the land the Hawaiian and part Hawaiian people whose forbears were agriculturists in the period prior to annexation.

The Hawaiian people have been gradually drifting into the cities, many living in tenements far removed from their natural environment. Upon the passage of the act the commission's funds, derived from Territorial land, leases, and water licenses, became available and were ample to make a start.

### DOCTOR MEAD INVESTIGATES PROJECT

Upon the invitation of the commission, Dr. Elwood Mead, then at the head of the Land Settlement Bureau of California, was invited to make an investigation of the proposed project. Doctor Mead after a careful survey made many helpful recommendations, among them a reduction in the size of farms and careful selection of settlers for the settlement of lands. These last two suggestions have been adhered to by the commission.



Farm home of William Aki, resident on the project three years, showing crop of alfalfa

Each homestead tract is not less than 20 acres nor more than 80 acres. These tracts are leased for a term of 99 years at a rental of \$1 per acre. The settler is privileged to borrow from the commission up to a limit of \$3,000 for purchase of farm equipment, stock, and to build a house. The interest rate is 5 per cent and payments distributed over a period of 30 years. The requirement is that the homesteader must live on the land, pay his taxes, and be a producer. The aim

of the whole plan is for the government to help the settler to help himself.

Mr. Rudolph Duncan, secretary and manager, is a Hawaiian who has exercised good judgment in the selection of settlers. Before applicants are granted leases they are required to answer a list of questions, then they are personally interviewed, and those chosen who give promise of success.

On the island of Molokai during the past four years 116 families have been located, carrying a population of approximately 700 persons.

## Reclamation Project Women and Their Interests

(Continued from page 44.)

lettuce, peas, and spinach can be planted at intervals throughout the season, and consequently they will seldom be missing from the family table after the first crop has matured. A number of crops can be given a start of 10 days to three weeks if the seeds are planted in a window box or "flat." Tomatoes, cabbage, peppers, eggplant, cauliflower, and lettuce can thus be started early.

A small garden is not hard to take care of if it is carefully planned on paper before it is set out. On the farm a good-sized space can sometimes be devoted to what is usually known as the "farm" or "kitchen garden." A garden planted in long narrow rows is easiest to cultivate. One long row may have several different vegetables planted in it.

Plant only such vegetables as will yield good returns for the table in proportion to the space they occupy if available ground is limited. Potatoes, corn, cucumbers, melons, and peas require considerable space. Lettuce, spinach, beets, carrots, snap beans, or tomatoes are more economical of space and therefore adapted to growing in a small area.

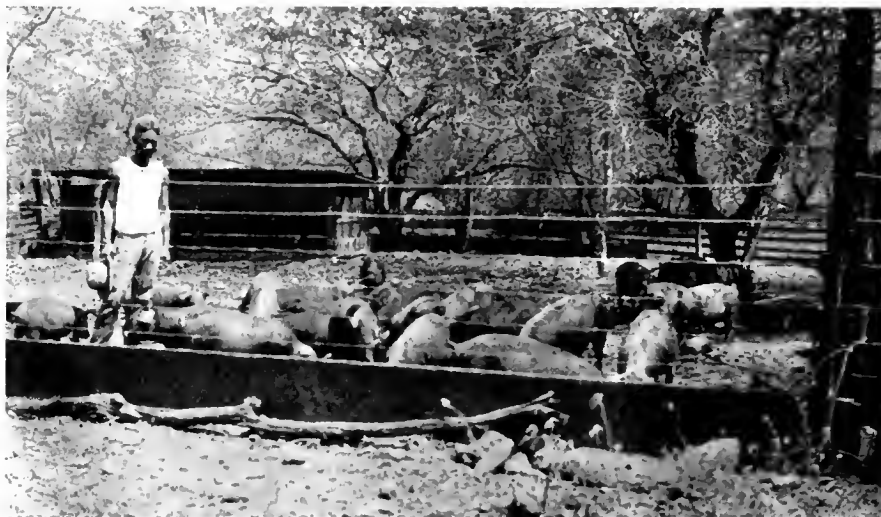
The individual tastes of the family will, of course, determine largely what is to be planted in the garden. All of the green-leaf vegetables, such as spinach, cabbage, kale, beet greens, and lettuce, are rich in vitamins. Carrots, rutabagas, tomatoes, and string beans are also excellent. All vegetables furnish minerals and roughage as well as vitamins, and so are important in the diet of most persons.

### CONTENTED SETTLERS

In company with Secretary Duncan, Farm Advisor Roland Gay and Dr. W. T. Pope, horticulturist of the United States Experimental Station, the writer visited the project and noted its progress.

The large tract known as the Palaa and Hoolehua district is where dry-land farming is practiced with water piped to each house for domestic purposes. This land is a rich producing area. Here are located 74 farm allotments upon which are found contented settlers. A community center has been arranged with a good school of several rooms and a large community playground for athletic sports, affording an opportunity for get-together meetings, the aim being to remove any thought of isolation. Good roads and fences are provided. A community pasture of 10,000 acres is set aside for stock raisers; in fact, the government is doing everything possible to guide the settlers along the right lines on these one-family farms.





David Kaai and pen of swine, Kalaniana'ole settlement

We visited and talked with many settlers who have been on the land for over two years. We found contented farm folks enthusiastic and willing to work. In no single instance did we find dissatisfaction. A case in point—Mitchell Panole, a young shoe clerk in Honolulu, could not make ends meet with a family of four children. After two years' residence on a 40-acre tract this young man said: "I knew nothing about farming when I came here. I am getting ahead growing vegetables, swine, and poultry. I am paying off some of my indebtedness and am making real progress." He is one of many who gave like testimony.

Adjoining this tract the commission is putting out a 500-acre pineapple plantation where it will be possible to give employment to settlers in the future, assisting them in carrying on their payments on their farms, and give employment to members of their families.

#### COOPERATIVE ORGANIZATIONS

Plans are now under way to organize a cooperative marketing association to market farm products. The Hawaiian settler is rapidly learning the importance of cooperative effort.

Few leases have been canceled since the opening of the lands, and these have been quickly taken up by new settlers awaiting the opportunity of being selected.

In the Kalaniana'ole district near Kaunakaki are 22 farms and 18 house lots. Here irrigation is provided and 10 crops of alfalfa produced annually. The farms average about 10 acres. Substantial houses are provided, many of the houses being built by the farmers who were mechanics or carpenters before becoming farmers. Swine and alfalfa have proved most profitable, and there is a ready sale for alfalfa hay.

The work accomplished in the rehabilitation on the island of Molokai is worthy of the highest encomiums. The taking of city dwellers, inexperienced in agricultural pursuits, and helping them to help themselves is most unique. The management is efficient. The growth has been slow but sure and it has not been a boom program. At present there are over 700 applications to be considered. Plans are under way to provide irrigation to the dry-land farmers. It will come because the plan is feasible and its development will be businesslike.

Those of Hawaii backing this movement to assist worthy Hawaiians back to the soil, thereby dignifying labor through ownership, are building better than is generally realized a rehabilitation program that challenges the admiration of the nation.

## Acid Phosphate Helps Growth of Alfalfa

Marked improvement in the growth of alfalfa followed the application of acid phosphate in tests conducted by the United States Department of Agriculture on the Yuma project, Arizona-California. The experiments were undertaken to determine the cause of the decline in yields of alfalfa hay and alfalfa seed, crops which from the beginning have constituted the backbone of the farming industry on the project.

In the course of the tests barnyard manure alone did not show sufficient benefit to justify paying much for it. Neither gypsum nor sulphur had an appreciable effect on yields. Sulphur combined with acid phosphate gave a somewhat larger yield, though considerably less than the same quantity of acid phosphate applied alone. The use of acid phosphate tends to decrease soil acidity.

The foundation and framework of a cooperative marketing organization are to aid those producers who have united or who may unite in the enterprise to conduct it along sound and successful business lines.

One of the cardinal principles in a cooperative association is that the voting shall be on the basis of members, whereas in the case of the commercial corporation the voting is on the basis of money—each shareholder having as many votes as he has shares of stock.



Whalen diversion dam, North Platte project, Nebraska-Wyoming



## Contract Between United States and Pathfinder Irrigation District

THE Pathfinder Irrigation District includes within its boundaries about 111,000 acres of irrigable lands which receive their water supply from the irrigation works constructed by the United States for the interstate division of the North Platte project, Nebraska-Wyoming, of which area approximately 106,000 acres are covered by water-right applications and approximately 5,000 acres of irrigable land are not covered by water-right applications.

A contract, effective July 31, 1926, has been entered into between the United States and the district under the provisions of section 4 of the act of Congress approved December 5, 1924 (43 Stat. 672).

The individual water-right applications filed by the landowners and entrymen under the various public notices applicable constituted contracts between such landowners and entrymen and the United States, hence it was necessary for such application landowners to execute an instrument agreeing to abrogate their water-right applications and accept the terms of the contract. Those who executed the instrument became consenting application landowners and those who did not became nonconsenting application landowners.

### REPAYMENT PROVISIONS

The district assumes and agrees to pay to the United States the total construction charges as follows: (item 1) The total as of the effective date of the contract of the unpaid construction indebtedness (including interest and penalties as determined by the Secretary) to the United States of all the consenting application landowners; (item 2) the amounts of operation and maintenance charges (including interest and penalties) funded upon consenting application land under subsection L of the act of Congress of December 5, 1924; (item 3) the consenting application landowners ratable proportion of the book value of equipment and supplies transferred to the district under the terms of the contract; (item 4) the total of the unpaid construction indebtedness, including interest and penalties, of all the nonconsenting application land owners; (item 5) the construction charge at the rate of \$71 per acre upon the irrigable acreage of nonapplication land (as determined by the Secretary) the district is to assume a primary obligation to make payment of the unpaid construction indebtedness of all nonconsenting application landowners only if said landowners fail to make payment. The payment of the construction charges by the district to the United States shall continue until it has been fully repaid to the United States.

The district will act as fiscal agent of the United States for the collection of construction charges hereafter due the United States from the noneconsenting application landowners, landowners having land under water-right application in the interstate division of the North Platte project, but not included within the boundaries of the district, whether such land lies in the State of Nebraska or in the State of Wyoming. As fiscal agent of the United States the district will also collect the charges hereafter due the United States from the Pleasant Valley Lateral Association and the Lingle Water Users' Association. The district, as fiscal agent, is constituted by the United States the assignee of any power possessed by the United States to enforce the collection of charges.

### CROP REPAYMENT BASIS

In addition to the payments to be made as fiscal agent, the district will pay to the United States each year a construction charge which will be determined by multiplying the average rate per acre by the total number of irrigable acres of (1) consenting application lands and (2) nonapplication lands subject to construction charges as said total number of acres is determined and announced annually by the Secretary. The average rate per acre to be used in determining the annual construction payment to be made to the United States will be 5 per cent of the average gross annual acre income of the area of (1) irrigable consenting application land and (2) irrigable nonapplication land in cultivation in the district for the 10 calendar years first preceding the announcement of the average rate per acre by the Secretary. All findings by the Secretary as to the average rate per acre and the irrigable area subject to construction charges are conclusive. In announcing to the district the total number of irrigable acres upon which construction charges are to be collected the Secretary will omit any acreage which at tax sale on account of, among other charges, delinquent assessments made by the district to carry out the contract has failed to sell for a price sufficient to pay the taxes due thereon, and said acreage will not thereafter for a period of three years be included in said total number of irrigable acres or for such period longer than three years, as to the Secretary may appear advisable. The total acreage upon which construction charges shall be assessed by the district is never to be reduced below 80,000 acres.

The total sums due each year from the district to the United States (exclusive of

the amounts which the district is to collect as fiscal agent of the United States) are general obligations of the district, and the district will each year levy assessments sufficient to pay the same in full to the United States, together with any deficiencies established by tax sales.

The district is required to purchase at tax sales any lands upon which the taxes shall become delinquent or purchase the tax certificate from the county in case the county holds the same and in accordance with the law of the State of Nebraska foreclose the tax lien. If at the foreclosure sale the net amount received is insufficient to pay the charges due the United States, the district in its next assessment will include an additional levy to meet such deficiencies.

No water shall be delivered to the district when it is more than 12 months delinquent in the payment of any construction or operation and maintenance installment which the district has agreed to pay from assessments levied upon district land.

The noneconsenting landowners will have his lands continued upon the basis of the terms embodied in his existing contract and shall not be entitled to any of the benefits of this contract nor the release of any liens reserved in favor of the United States.

All the benefits of the contract are conditioned upon payment by the landowner of the assessments levied by the district against his tract of land, and if for any reason the landowner fails to make such payments he shall revert to the obligations and terms of payment provided for in his existing contract with the United States and the district shall, as fiscal agent for the United States, collect such charges from him.

### OPERATION OF WORKS

The operation and maintenance of certain of the works built for irrigation of the lands of the North Platte project is retained by the United States. Included in such works are the Pathfinder reservoir, the Guernsey Dam and power plant, the Whalen Diversion Dam, the Lingle power plant and transmission lines, the Interstate Canal from its head to station 2, and the headquarters buildings at Mitchell, Nebr.

Effective July 31, 1926, the care, operation, and maintenance of the works built for irrigating the lands of the interstate division of the North Platte project were transferred to the district.

The district is obligated to deliver water to all the lands within the bound-

(Continued on page 48)

## Organization Activities and Project Visitors

COMMISSIONER MEAD was in New York February 14 and 15 to address the New York farmers on the subject of reconstruction of rural life, illustrated with motion pictures of scenes on the reclamation projects.

Andrew W. Simonds has been appointed an assistant engineer in the Denver office.

Emmett R. Crocker, associate engineer, formerly on the Umatilla project and on secondary investigations, has been reinstated for assignment to the designing section of the Denver office.

The representatives of the Bureau of Reclamation, the Indian Office, and private irrigation projects, comprising Porter J. Preston, L. M. Holt, and R. S. Carberry, appointed by the Secretary to study and report on operation and maintenance methods and costs, completed

their report in the Denver office the latter part of January.

Julian A. Buendia and Procopio Elcazar, engineers from the Philippine Islands, were recent visitors at Stony Gorge Dam, Orland project.

District Counsel W. J. Burke spent some time in the Washington office on legal matters connected with the projects in his district.

A. N. Talcott, locating engineer of the Chicago & North Western Railway visited the Belle Fourche project recently to confer on matters relating to the beet spur to Vale.

C. C. Elder, assistant engineer, assisted by M. P. Trossello, continued stream gaugings, evaporation measurements, and

ground-water observations in the middle Rio Grande Valley between Embudo and San Marcial.

Col. B. F. Fly, who has been seriously ill in Washington, D. C., has again taken up his duties in behalf of the Yuma project after an absence from the Washington office of about three weeks.

W. S. Post, consulting engineer for the East Bay Utilities District of Oakland, Calif., was a recent visitor on the Orland project.

Henry H. Plumb, engineer from the Denver office, spent several days on the Boise project in connection with construction details at Black Canyon power plant and proposed construction at Vale. He also visited the Minidoka project to confer upon the work in progress at the Minidoka power house.

Doctor Mead, P. W. Dent, George C. Kreutzer, W. F. Kubach, and H. A. Brown left the Washington office for the Denver conference about the middle of March. From there Doctor Mead will visit several points in the West, leaving on March 30, accompanied by Mr. Brown, for the Pan-Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation to be held at Honolulu, Hawaii, April 11 to 16. On his return, about the end of April, Doctor Mead will visit several points in the Northwest.

H. W. Lawler, general superintendent of the Utah Construction Co., was a recent visitor at Gibson dam site, Sun River project.

Kirk Bryan, geologist of the United States Geological Survey, has been making a geological examination of Avalon Reservoir, Carlsbad project.

Among recent visitors to the Klamath project were E. F. Benson, agricultural development agent of the Northern Pacific Railway, and H. Lloyd Miller, of Sunnyside, Wash.

Harry Rowe, division freight and passenger agent of the Chicago, Milwaukee & St. Paul Railway, was on the Kittitas division of the Yakima project to discuss freight rates on sand and gravel.

## Contract with Pathfinder Irrigation District

(Continued from page 47)

aries of the interstate division whether such lands are in the district or not. For lands not included in the district the operation and maintenance charge as announced by the Secretary will be collected by the district as fiscal agent for the United States. The obligation of the district to deliver water is to be carried out in accordance with the reclamation law, and the rules and regulations of the Secretary. Each tract of land receiving water through the transferred works is required to pay the operation and maintenance charge in advance, and water will not be delivered until such has been paid.

The cost incurred in operating and maintaining the works reserved by the United States will be furnished to the district and it will pay to the United States the consenting land's proportionate part of such cost.

All books and records that the Secretary may require will be kept by the district and the same shall be open to inspection by the United States.

### CROP CENSUS

An annual crop census and investigation of the acre income may be made under the direction of the Secretary for the purpose of checking the records furnished by the district. The Secretary

may require that information concerning the crops and income produced on the lands under the transferred works be given under oath and in the event of refusal to so give any information the person refusing shall be refused water delivery.

The superintendent employed by the district is to be satisfactory to the United States and should he prove unsatisfactory the district will upon notice from the Secretary discharge him.

The United States reserves the right to inspect the transferred works to see that they are being properly cared for, the cost of such inspection to be paid for by the district. No substantial changes in the transferred works are to be made without the consent of the Secretary. If the district should fail to keep the transferred works in good condition, the United States may make the necessary repairs and charge the cost to the district. In case of a breach of any of the terms of the contract the United States reserves the right upon one year's written notice to terminate the contract and to take over the transferred works.

The execution of the contract was authorized by the electors of the district at a special election and the contract confirmed by the district court in and for Scotts Bluff County, Nebr.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

George C. Krutzer, Director of Reclamation Economics

P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. A. Bissell, Chief of Engineering Division

C. N. McCulluch, Chief Clerk

Denver, Colorado, Wildo Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	W. L. Vernon.....	B. E. Stoutemyer.....	El Paso, Tex.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	Montrose, Colo.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Billings, Mont.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	M. M. Wilson.....	E. E. Roddis.....	Berkeley, Calif.
King Hill <sup>1</sup> .....	King Hill, Idaho.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Billings, Mont.
Klamath.....	Klamath Falls, Oreg.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Do.
Lower Yellowstone.....	Savage, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	B. E. Stoutemyer.....	Portland, Oreg.
Milk River.....	Malta, Mont.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	R. J. Coffey.....	Mitchell, Nebr.
Minidoka <sup>1</sup> .....	Burley, Idaho.....	A. W. Walker.....	O. B. Snow.....	Miss E. M. Simmonds.....	Wm. J. Burke.....	Portland, Oreg.
Newlands <sup>1</sup> .....	Fallon, Nev.....	Calvin Casteel.....	L. H. Mung.....	N. D. Thorp.....	B. E. Stoutemyer.....	Berkeley, Calif.
North Platte <sup>1</sup> .....	Mitchell, Nebr.....	R. C. E. Weber.....	W. D. Funk.....	C. H. Lillingston.....	B. E. Stoutemyer.....	Portland, Oreg.
Okanogan.....	Okanogan, Wash.....	F. A. Banks.....	C. H. Lillingston.....	C. H. Lillingston.....	H. J. S. Devries.....	El Paso, Tex.
Orland.....	Orland, Calif.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	Wm. J. Burke.....	Mitchell, Nebr.
Owyhee.....	American Falls, Idaho.....	H. D. Comstock.....	R. B. Smith.....	R. B. Smith.....	E. E. Roddis.....	Billings, Mont.
Rio Grande.....	El Paso, Tex.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Do.
Riverton.....	Riverton, Wyo.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Salt River <sup>1</sup> .....	Phoenix, Ariz.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Shoshone <sup>1</sup> .....	Powell, Wyo.....	H. W. Bashore.....	R. K. Cunningham.....	J. C. Gowler.....	B. E. Stoutemyer.....	Portland, Oreg.
Strawberry Valley <sup>1</sup> .....	Provo, Utah.....	H. J. Gault <sup>11</sup> .....	M. J. Gorman.....	E. M. Phlebaum.....	R. J. Coffey.....	Berkeley, Calif.
Sun River.....	Fairfield, Mont.....					
Umatilla <sup>1</sup> .....	Hermiston, Oreg.....					
Uncompahgre.....	Montrose, Colo.....					
Vale.....						
Yakima.....	Yakima, Wash.....					
Yuma.....	Yuma, Ariz.....					

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>10</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>10</sup> .....	Chas. Klingman.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>11</sup> .....	E. R. Mills.....		B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gibson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>11</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Damsite, Elk Creek, Calif.....	H. J. Gault <sup>11</sup> .....	C. B. Funk.....		R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on April 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

<sup>10</sup> Resident engineer.

<sup>11</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise.....	Boise, Idaho.....	R. J. Newell.....	Middle Rio Grande conservancy district.
Middle Rio Grande.....	Denver, Colo.....	I. E. Houk.....	State of Utah.
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	State of Wyoming.
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



LEVELING LAND ON AN IRRIGATION PROJECT

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Dec.  
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1927

# NEW RECLAMATION ERA

VOL. 18

APRIL, 1927

NO. 4



PREPARING FOR THE SUMMER CROP ON THE GRAND VALLEY PROJECT



## *Conserve the Water*

*THE GREAT STRUCTURES of the Bureau of Reclamation were built for the purpose of storing or diverting water for agricultural purposes. Each Federal irrigation project is based upon a more or less definite water supply which may be used for irrigation purposes. There is in the West, and under most of the projects, much more land than water. Under the most extensive system of water storage and the most careful use of water, only a small portion, perhaps less than one-fifth, of the arid region may be brought under irrigation. The test of the fitness of engineering structures on the Federal irrigation projects is the quantity of water which they make available.*

*The wise and economical use of water must be the main concern of all interested in the development of the projects, as well as in the development of the arid and semiarid area of the country. In fact, it is not the quantity of water secured by irrigation structures that determines the area of irrigated land, but rather the manner in which the available water is used. The extent of reclamation, the character of agriculture under the ditch, and the permanence of a civilization built upon irrigation depend upon the use of irrigation water; that is, upon irrigation practice.*

# NEW RECLAMATION ERA

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HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

APRIL, 1927

No. 4

## *Interesting High Lights on the Reclamation Projects*

**T**HE State of Colorado, through the University Extension Service, has been conducting a series of experiments on the Uncompahgre project in the feeding of lambs for market. These experiments have been watched with great interest by Grand Valley project farmers who have been inspecting the pens and reviewing the results obtained.

**M**ANY inquiries are being received in the project office of the Uncompahgre project and by the various commercial organizations relative to opportunities for obtaining farms on the project.

**T**HE local canning plant at Delta, Uncompahgre project, has been leased by the bondholders to the Currie Canning Co., of Grand Junction. The lease covers a five-year period and insures the continued operation of the plant. It is estimated that approximately 100 carloads of beets, beans, cherries, peaches, and other products will be handled by the plant during the coming season. The operation of this plant will provide a good outlet for certain fruits and vegetables, besides giving employment to a large number of people and adding to the prosperity of the valley.

**P**OTATO shipments continued heavy from the Minidoka project, 367 carloads being moved from the project during February.

**C**OLLECTIONS of 1927 maintenance assessments by the Burley Irrigation District, Minidoka project, have been very encouraging. Out of a total billing of approximately \$102,000, which included the charges for excess water used in 1926, about \$80,000 was received in time to obtain the 5 per cent discount allowed for payment on or before March 1. Maintenance had been paid in advance on about 38,000 acres.

**D**URING the month 305 carloads of agricultural products were shipped from the Yuma project, valued at \$361,300, making the total value of such products shipped since the first of the year \$754,200.

**O**NE hundred sixty acres on the Mesa division of the Yuma project are being prepared for planting this year, which will bring the total to 835 acres under development.

**A** STATE economic conference on the dairy and poultry industries was held recently at Fallon, Newlands project, under the auspices of the Nevada Extension Service. Several constructive talks were made and effective committee work was initiated to develop these industries on the project.

**A** NEW community building was dedicated recently at Fallon, Newlands project. The building cost approximately \$50,000 and was financed locally through the sale of stock. Practically all the local fraternal organizations united in the successful completion of the building.

**K**LAMATH County's first agricultural economic conference was held recently at Klamath Falls, Oreg. From the facts and figures assembled by the different committees, potatoes, red clover, and pasture were shown to have returned the greatest profit to the growers on the Klamath project. The poultry committee report showed that Klamath County imports annually approximately 8,000 cases of eggs, which could be produced by local flocks.

**A**PPLE prices were picking up on the Okanogan project, Winesap apples left from last year's crop being sold at about \$2 a box for the best grade.

**T**HE excellent cold-storage facilities in the Yakima Valley have made it possible to hold the greater part of the apple crop, awaiting more favorable market conditions. The indications are that the crop will be disposed of at a profit.

**T**HREE promising applicants for farm units on the Riverton project have moved to Riverton and rented land under private irrigation with a view to taking up homesteads on the project later on if suited with the country. The number of inquiries concerning opportunities on the project has shown a market increase recently.

**T**HERE is considerable activity in the poultry business on the Shoshone project, and a poultry marketing association is being formed which includes a portion of the Frannie division. One farmer in that division is said to have ordered 10,000 baby chicks.

**T**HE Secretary of the Interior on March 16 decided that 95.6 per cent of the power profits should be credited to the Burley irrigation district, that rentals of grazing land should be credited to the district where the lands are located, and that the proceeds of the sale of town lots should be credited to the Minidoka irrigation district.

**T**HE Vale community, Belle Fourche project, entertained the Belle Fourche, Newell, and Nisland commercial clubs recently to celebrate the advent of the new sugar factory and the location of a railroad line to Vale. The new plant at Belle Fourche is to be known as the Black Hills factory of the Utah-Idaho Sugar Co. Bids are being received by the Belle Fourche Commercial Club for the first sack of sugar manufactured in the new plant, and at the end of the month the bid stood at \$250.

## *Hampshire Sheep from Orland Project vie with those from Belle Fourche*

*By R. C. E. Weber, Superintendent Orland Project*

ON the back page of the December, 1926, NEW RECLAMATION ERA there appeared a photograph of Hampshire sheep on the Belle Fourche project. Mr. J. J. Cornwell, an Orland project water user and a reader of the ERA, upon seeing the photograph called my attention to the fact that he had, he believed, a much better looking collection of Hampshires than those shown in the photograph from Belle Fourche. I suggested to him that he secure a photograph of his sheep which I could mail to you, and after some difficulty in obtaining a photograph, he has supplied me with a picture of a portion of his drove (see outside back cover page). I was at Mr. Cornwell's place yesterday, saw his sheep; and am inclined to agree with him that they are superior to those shown in the photograph from the Belle Fourche project. At least I think that his sheep warrant mention in the ERA.

Mr. Cornwell is an architect by training, but left that profession about eight years ago to take up farming on the Orland project. He acquired a 40-acre ranch which he has developed from an unimproved condition to a place of many diversified improvements. Almonds are planted on nearly one-third of his farm. Other trees consist of prunes, apricots,

figs, peaches, and olives. Eight acres are seeded to alfalfa. Mr. Cornwell practices interplanting of barley and other forage crops in his orchards and derives most of the feed for his sheep from this source.

Mr. Cornwell's Hampshires, numbering about 30, are pedigreed stock from the Stevens herd of England. The sire for his drove was obtained from the University of California farm at Davis, Calif. During 1926 his increase was 146 per cent—that is, every other ewe gave birth to twins.

Even though the Hampshire breed is primarily a mutton sheep, Mr. Cornwell reports an average of 10 pounds of wool per clipping from his herd last year. His rams command a price of \$35 and \$40 at weaning time.

THE Lower Yellowstone Development Association, which is sponsored by the Sidney Chamber of Commerce, assisted by the Northern Pacific and Great Northern Railroads and other interests, has employed a field man to work in Colorado, Utah, and Nebraska territory for settlers. The railroads report that their advertising campaign is getting a large number of inquiries.

Cows that freshen in the fall rank highest in average yearly production of milk and butterfat, in the cost of feed, and in income over cost of feed.

The dairyman who sells his milk to a city retail trade should have his cows freshen at all seasons of the year so as to keep up a steady, constant flow of milk.

Hay eured in the windrow or cock retains more of its leaves, thereby increasing its feeding value.

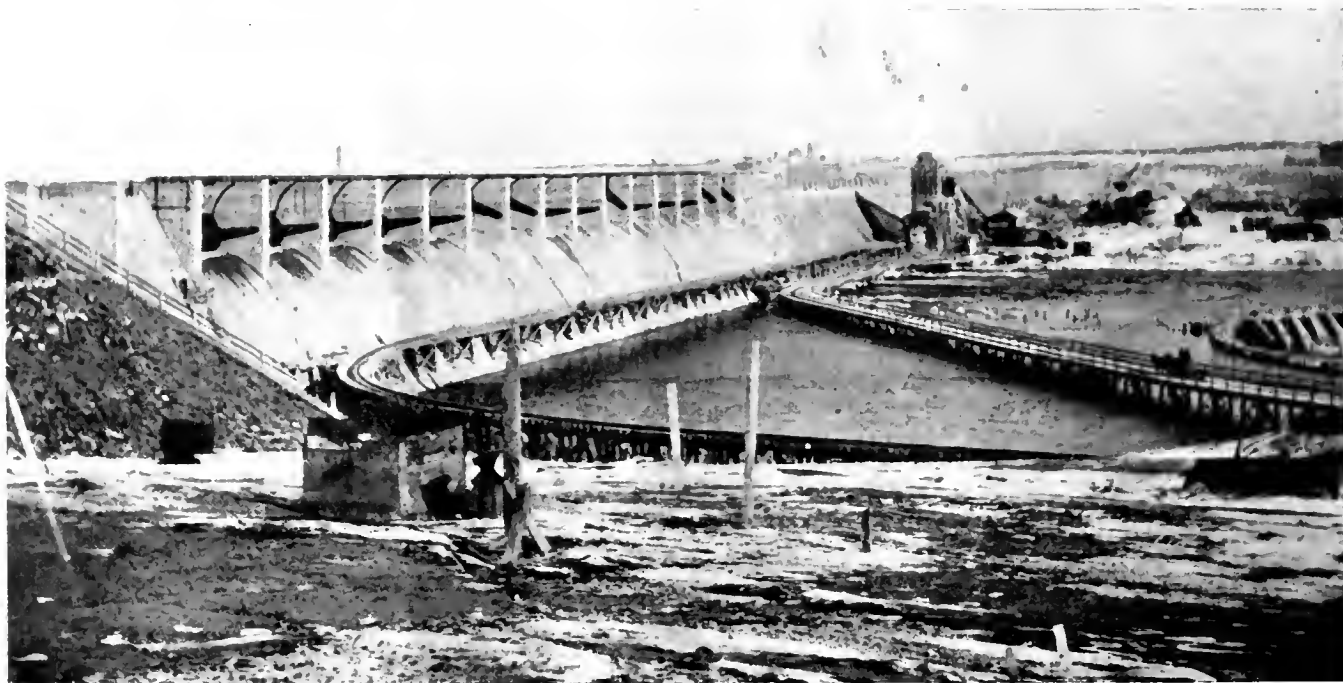
The open shed or covered barnyard is a practical method of housing dairy cows.

The open shed provides the best-known method of saving and preserving all the fertilizing constituents of the manure.

The open shed permits the feeding under shelter of roughage and makes possible its utilization for bedding.

When there is plenty of bedding, cows housed in the open shed keep cleaner than those confined in stanchions.

Only sound, healthy sweet potatoes should be selected for seed, and only from vines the stems of which are not rotted or otherwise abnormal.



American Falls Dam from West River bank

# Extracts from *A Résumé of the Department of the Interior*

(March, 1926 to March, 1927)

**I**MPORTANT changes in the administration of the Department of the Interior occurred during the past year. A number of new national undertakings was developed relative to the department's activities. Public service was facilitated through the installation of improved methods in the conduct of its business.

## COLORADO RIVER IMPROVEMENT

One of the foremost issues before the country is the control and development of the Colorado River.

For half a century this question has been studied by the Federal Government. For two decades it has been before Congress. No less than 55 measures have been introduced in the Senate and the House providing for various phases of the river's development.

Last year the Interior Department urged that the National Government should without delay aid in the settlement of the Colorado River problem or get out of the way of private enterprise. For the first time concrete and specific recommendations comprehending the diversified and coordinated uses of the river were made to Congress by the department.

It was proposed that the project, which provided for the construction of an immense dam at Boulder Canyon, be built through a national bond issue rather than by appropriations out of the United States Treasury. Plans for the development, as outlined, solved all the questions connected with the river. Flood control with the rescue from constant menace of 60,000 people and \$60,000,000 of property in the Imperial Valley was provided for. Storage of water for the irrigation of additional desert lands and for domestic and household purposes, the all-American canal, and the manufacture of hydro-electric energy were included in the scheme. Revenues from the project, it was estimated, would redeem the entire bond issue in 50 years. Proposals by the department were immediately accepted by proponents of legislation which had been introduced in the Senate and the House.

Although no action was taken by Congress at its last session, public interest in the development of the Colorado River has been aroused. The project has become a question of vital concern to the Nation as a whole. The harnessing of an international stream to prevent floods and

the general prosperity of the southwestern section of the United States are involved.

## FEDERAL RECLAMATION

Relief for farmers on Federal irrigation projects became an accomplished fact. Through the enactment of legislation by Congress approximately \$27,500,000 of their obligations were charged off or suspended as a loss to the Government. This sum represented construction costs of works built for the irrigation of worthless lands, including engineering errors, failure of water supply, and other unreturnable expenditures.

Other revisions in national policies dealing with Federal reclamation were effected. Under authority of Congress local management and operation of projects by the farmers was inaugurated, supplanting long-distance and hired supervision by the Federal Government. A plan of selecting settlers with the necessary qualifications to assure success after they had taken up farms on the projects was adopted. Boards of examiners were appointed to examine applicants for irrigated farms under Federal canals.

In the past it has been the custom to grant extension of time to water-users when their construction charges fell due. This practice was stopped by the department. It was urged upon Congress that further suspension of these repayments would have the effect of nullifying the reclamation law and menacing the future success of reclamation.

For the first time a tentative 10-year construction program for the completion of all existing Government projects was presented to Congress. Estimated expenditures amounted to \$95,514,000. Under this program, 22 unfinished projects in 17 Western States would be completed by the end of 1927, should Congress approve it.

## RURAL DEVELOPMENT IN SOUTH

A new national policy was developed relative to the reclaiming of neglected and abandoned lands in Southern States. Congress authorized the expenditure of \$100,000 for this purpose. Six typical tracts of land were selected in the South which, if reclaimed, would provide farms and homes for more than 100 families.

In cooperation with State governments a special committee of advisers was selected outside of the Government service by the department. This committee

in company with the Commissioner of Reclamation made a trip of inspection and study into conditions affecting the development of these areas.

The report of these special advisers is the first comprehensive discussion of the agricultural, social, and economic problems of the South. As a result the proposed reclamation of neglected and abandoned lands is gaining impetus. Success of this movement does not depend on the physical rejuvenation of the land. This must be supplemented by organized farming communities properly equipped and united in cooperative organizations for the solution of both economic and social problems.

Leading citizens of the South have become interested in this national question. Since the investigation by the special advisers, eight States have joined in forming an organization to promote the movement. Expenditures out of the Federal Treasury are not contemplated in the reclaiming and settlement of these neglected lands. The actual undertaking of the work is to be done by State and private activity.

## Payment of Flood Damages

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized and directed (1) to cause a survey to be made in such manner and under such regulations as he deems necessary for the purposes of this act to determine the property loss by flood by reason of the overflow of the Rio Grande River on August 17, 1921, sustained by Lucas Trujillo, Juan Bians, Mariano P. Padillo, Bruno Perea, Juan Jose Trujillo, Miguel Trujillo, Francisco Saiz, Antonio Provencio, B. R. Carreros, Santiago Serna, Roman M. Herrera, and other property owners who are citizens of the United States residing at or in the vicinity of Hatch and Santa Teresa, New Mexico; and (2) to pay such losses in full if the amount appropriated in section 2 of this act is sufficient or, if such amount is insufficient, to pay to each person such percentage of the amount of his property loss as the amount appropriated bears to the amount determined by the Secretary as the property loss sustained.*

SEC. 2. There is hereby authorized to be appropriated, out of any money in the reclamation fund of the Treasury the sum of \$75,000 or so much thereof as may be necessary for the purposes of this act.

Approved, February 25, 1927. (Private, No. 396.)

## Stony Gorge Dam, Orland Project, California

By Byrum W. Steele

The Stony Gorge Dam, now under construction on the Orland project in California, will be of reinforced concrete. It will have an overall length of about 900 feet and a maximum height above the stream bed of about 120 feet. It will be of the Ambursen type, the essential features of which are an impervious inclined upstream face designed as a flat slab and supported by concrete buttresses. The upstream face is placed at an angle of approximately 45° with the horizontal so that the weight of the water impounded and lying above the dam adds to its stability. The general plan, elevation, and sections of the dam are shown on the drawing on opposite page.

The contract for the construction of the dam, bids for which under specifications No. 449 were received on August 18, 1926, has been awarded to the Ambursen Construction Co. of New York and San Francisco. This dam is located on Stony Creek about 40 miles southwest of the town of Orland. Stony Creek, at the north end of the reservoir site, swings westward, cutting through a low range of hills which owe their existence to the occurrence of a series of sandstones and shales. Where Stony Creek breaks through this ridge is marked by a fault line, running parallel to the creek, the presence of which is largely responsible for the type of dam which has been selected.

The floor of the reservoir area is largely of impervious shale, the bedding planes of the shales and sandstones being tipped about 60° off the horizontal and toward the east. Thus the floor of the reservoir area and the dam site are rendered highly impervious to water as the seepage from the reservoir must travel perpendicular to the bedding planes except at the upper and lower extremities of the reservoir.

Various types of dams were considered for this location and the Ambursen was finally chosen as the type best adapted to withstand settlement or movement along the line of the fault. A multiple arch would probably cost a little less to build, but owing to spillway complications and the fact that any settlement or movement might prove disastrous, it was decided to discard the multiple arch type.

Spillway capacity for a flood of 30,000 second-feet is provided by three 30 by 30 feet stony gates which are mounted on the upstream face of the dam. These gates

are of the overflow type and are operated by means of stems connected to electrically operated hoists located in the spillway gate house on the top of the dam.

The outlets for irrigation water are located on the north side of the creek and are controlled by one 10-inch and two 42-inch balanced needle valves. The 42-inch valves are supplemented by high

### Diversification Will Keep Farmers Busy

*The following editorial is from the Yakima Daily Republic of February 11:*

*"Henry Ford is said to have made up his mind that he will show American farmers that if they will adopt efficiency methods they can get along with less than a month's work in a year. That will depend on what kind of a farm the flier man undertakes to demonstrate. No doubt there are many specialty or one-crop farms in the country which can be worked and handled in less than a month of actual time; where diversification is practiced and where the farm is a home as well as a factory the man who occupies it can keep himself busy for 365¼ tolerably long days, year in and year out. It is a fact of no little consequence, however, that the farmers who think they have a claim on the Government for relief are, as a rule, those engaged in producing specialty crops. No other kind of business could be made to pay in the short time they devote to production. Fundamentally, what the Government is being urged to do in connection with the proposed relief legislation is to assist a manufacturer who has a plant that he prefers not to keep running all the time, and who is in straightened circumstances mainly because he won't use his factory up to capacity."*

pressure emergency gates 3 feet 6 inches square, the emergency gates and balanced valves being connected by 50-inch riveted steel pipe. The gates, pipes, and valves are located between buttresses. The 10-inch needle valve is located between buttresses No. 35 and 36, receives its water supply through the same trash rack as the 42-inch valves, and discharges into

an 18-inch pipe leading to the south side of the river at the intake of the Angle-Troxel Ditch, for which service this valve is provided.

The truck haul on all materials shipped in is approximately 8 miles, Fruto being the terminus of the Southern Pacific branch from Willows on the main line.

It will require approximately 1,500,000 pounds of reinforcing steel for the concrete reinforcement. The buttresses are reinforced with rail steel, while the face slab and corbels are reinforced with billet steel. The majority of the reinforcement bars are cut to lengths and the bending done at the mill.

Concrete materials to be used for the dam have been tested in the laboratory of the Bureau of Standards at Denver and at the field laboratory established at the dam site, which is equipped to test the field specimens of concrete as the work progresses. Cobble rock 6 inches or less in diameter will be used in the concrete for cut-off trenches, buttress footings, and buttresses below elevation 774.0. In the buttresses above this elevation the maximum size of the coarse aggregate is limited to 3 inches diameter and in the face slab which is heavily reinforced the maximum size of coarse aggregate is limited to 1¾ inches in diameter. Sand will be measured by the inundation method, and gravel will be measured by means of batchers equipped with strike-off devices.

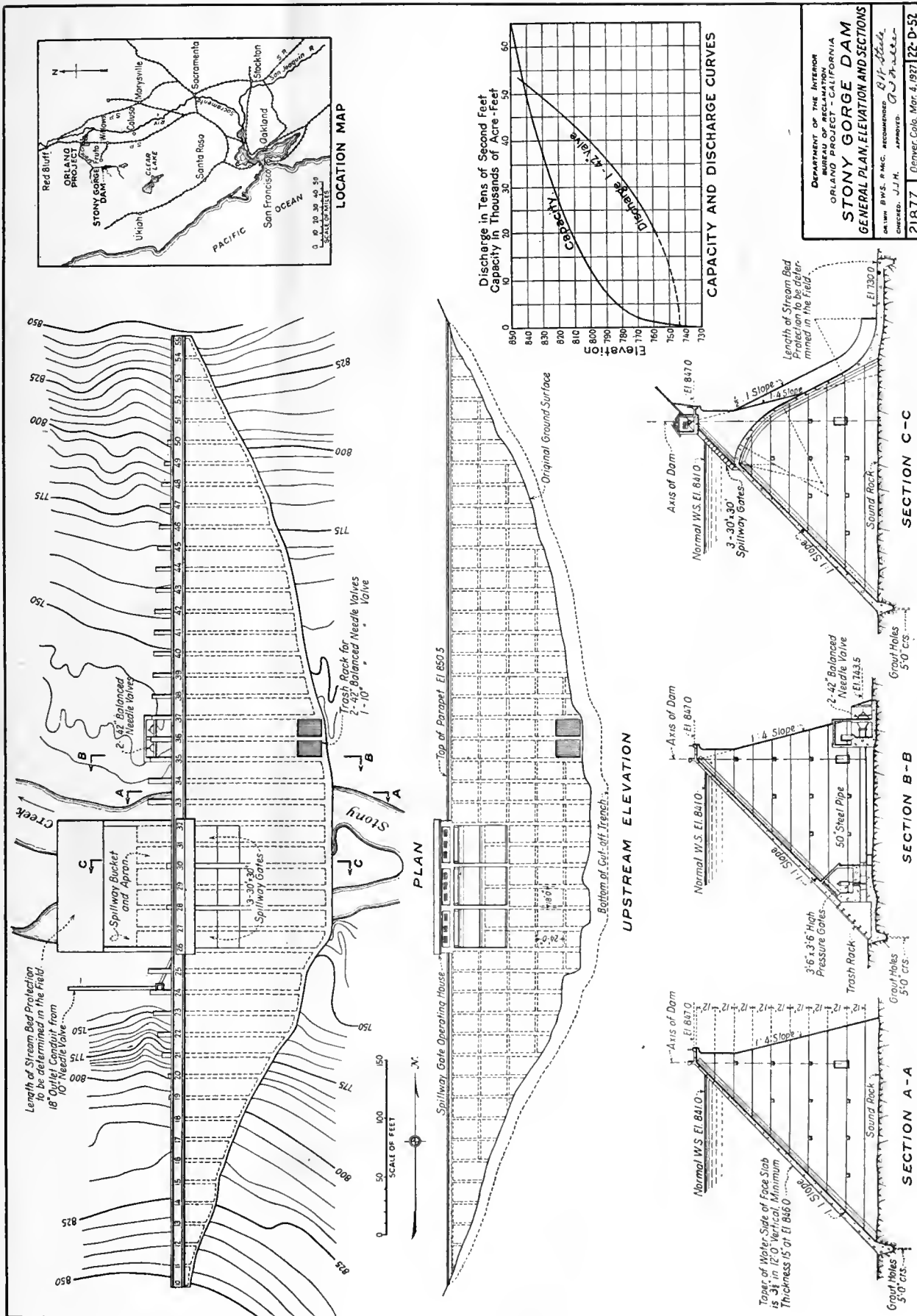
Power for lighting the dam and operating the spillway and high pressure emergency gates will be developed through batteries and a trickle charger from a small generator connected to a 15-inch pelton water wheel. A gas engine will be provided for use when the reservoir is too low to operate the pelton wheel.

It is proposed to drill grout holes about 5 feet apart in the upstream cut-off after the excavation has been completed, and this area will then be grouted to render it impervious to water under reservoir head. It is expected that considerable grouting will be necessary in the area surrounding the line of fault in order to cut off possible seepage from the reservoir floor.

Excavation for the buttress footings and upstream cut-off was started about the 1st of January, 1927, but it is not probable that any concrete will be poured before May, 1927.

There is no reason in the world why dairying should ever be conducted at a loss on any dairy farm over any considerable period of time.





(See opposite page)

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
ORLAND PROJECT - CALIFORNIA  
**STONY GORGE DAM**  
GENERAL PLAN, ELEVATION AND SECTIONS  
DESIGNED BY W.S. RMC. RECOMMENDED BY J.H. J.H. J.H.  
CHECKED BY J.H. J.H. J.H.  
21877 Denver, Colo., Mar. 4, 1927 22-D-52



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



### Pointers on Carving

Some men like their wives to carve, and others won't let them attempt it. Some like to carve standing up and some believe it is a breach of etiquette to do so. Common sense decides the matter in most households, for much depends on who is considered the best carver, the length of his or her effective reach, the height of the chair usually occupied, the tenderness of the meat or poultry to be carved, the sharpness of the knife, and the previous experience of the carver.

Above all things the carving knife should be sharp. It should be of the best size for the kind of meat to be carved—the small, light type for chicken or steak, and the larger, heavier size for roasts. Carving must be quickly done, before the meat has a chance to chill, and a sharp knife is an aid to speed as well as to the appearance of the food. Good carving results in neatly severed joints, flesh cut across the grain, thin appetizing slices or portions, dispensed so that everyone at the table has at least a bit of the choicer cuts and no one is left with only the undesirable parts.

The illustration shows how to carve a leg of lamb. Notice that the fleshiest side of the meat is uppermost and that the carver steadies the roast with the carving fork held in her left hand, while she slices *across the muscle* at right angles to the leg bone. Cutting the meat parallel to the bone, as one often sees it done, results in stringy portions, difficult to chew. A ham, smoked or fresh, is carved in the same way as a leg of lamb. Thin slices are to be preferred for all of these meats.

A rib roast of beef is carved horizontally—that is, across the grain. A standing roast of beef is placed with the ends of the ribs to the left of the carver. The butcher in trimming the roast should remove any bone at the upper or right-hand end that is likely to interfere with carving. The meat is sliced very thinly across the grain until the knife reaches the bone. When several slices have been cut the point of the knife is run along the edge of the bone to separate the slices from the ribs.

The first step in carving a steak with a T-bone is to trim this bone out. The steak is then cut into sections about an inch wide, beginning at the upper or broad end and cutting at right angles to



Carve lamb across the grain at right angles to the bone

the former position of the bone, through both tenderloin and large portion. In this way both tenderloin and ordinary steak are served to each person.

A rib roast of pork is generally "cracked" with a cleaver by the butcher so that each chop can be carved separately.

A shoulder of lamb presents more difficulty in carving than almost any piece of meat, because of the irregular position of the various bones. If the shoulder blade is removed by the butcher and the cavity stuffed the problem is simplified. The lines of the chops can be followed as far as they go.

The art of carving poultry varies with each kind of bird. The skillful carver is the one who knows exactly where to find the joints. In carving most poultry it is well to remove the leg and wing from one side first so as to slice the breast conveniently. The leg of a large bird may be cut into two or more pieces.

Upholstered furniture may be given a beating indoors if covered with a cloth which has been dipped in water and wrung as dry as possible. Use a flat beater. The damp cloth takes up the dust.

## Poke Shoots and Other Spring Greens

Do you know poke shoots, or poke salad as they are sometimes called? Perhaps as a child you made "ink" from the dark purple berries of the poke weed and stained your hands and clothes and were warned by your parents of the poison in the juice. It is true that the berries of the poke weed are poisonous and should never be tasted or eaten. The tender pink and green shoots of the poke weed that come up in the spring contain none of this poisonous matter, however, and are highly prized for greens in many localities. Some people call them poor man's asparagus. They do have the same kind of succulent texture and fresh earthy flavor. You may be able to find the poke weed growing wild in a nearby field or perhaps in a corner of your garden. In cutting the shoots you will find the small pink ones best, but you may also take the tips of the half-grown stalks. Do not use the larger green leaves for they will be bitter. In cutting the shoots take care not to include any of the underground part of the plant for the root is exceedingly poisonous. Also be sure that you are cutting the true poke weed. There is one variety sometimes called Indian poke which is poisonous in all its parts.

If poke weed does not grow wild in your locality, perhaps marsh marigold or cowslip does. That makes the best of all greens, some people think. With others lamb's quarters or wild dandelion is the favorite. You may have in your garden an abundance of turnip or mustard tops, young beet greens, kale, spinach, or perhaps so much lettuce that you can use it for cooked greens. Try the poke shoots, however, if they are available. They go particularly well with ham.

Poke shoots have a slightly pungent or bitter flavor which is disliked if too strong. It is customary, therefore, to cook them for 3 or 4 minutes in boiling water as you would any other vegetable, and then drain them and put them on to cook again in fresh boiling water, lightly salted. Young poke shoots are fairly uniform in size and are handled more easily if they are tied together in a bundle like asparagus. Poke shoots are best if seasoned simply with butter, and like asparagus may be served on toast.

If mustard, turnip, lamb's quarters, marsh marigold, or beet tops are used instead of poke they are chopped finely and cooked the shortest possible time in very little water. A hard-boiled egg may be used to give a decorative note and add to the food value, or if you have an abundance of garden lettuce, shred it, stir it up with melted butter in a heavy skillet, cover, let it steam and cook slowly for 4 to 10 minutes, and sprinkle lightly with salt before serving. Romaine lettuce is especially good for cooking, because it holds its shape and does not wilt down so completely as the softer kinds of garden lettuce.

Leather furniture coverings look better and last longer if they are rubbed occasionally with castor oil. This restores to the leather the oil that gradually dries out. The oil should be well rubbed in and any excess wiped off the surface, or it will collect and hold dirt which will darken the leather, and soil whatever touches it.

## Water Supply for Irrigation

Winter precipitation to date in the western mountain regions has generally been near normal or above, with unusually heavy packing of snow, so that favorable stream flows may be expected far into the coming irrigation season. With the exception of the Okanogan project, an ample irrigation supply is assured for all Federal projects. The American Falls and McKay Reservoirs, now nearing completion, will receive sufficient water to fill them if desired. Heavy snowfall in some localities, particularly in the Sierra-Nevada region, may result in moderate floods. Average conditions prevail generally in the Colorado River drainage basin, but on account of the insecure flood control situation at the head of Imperial Valley such average conditions for flood run-off are menacing.

ON condition that 4,000 acres of sugar beets are grown in the area tributary to the Burley factory, Minidoka project, and 4,000 acres in the Paul factory area, the Amalgamated Sugar Co. will pay a bonus at harvest time of 50 cents a ton, which when added to the base price of \$7.50 per ton previously agreed upon will allow the farmers \$8 a ton, with the privilege of participating in such further bonuses as the price of sugar may justify.

A. C. Cooley, in charge of demonstrations on Federal reclamation projects, was on the Minidoka project recently to attend the Burley Economic Conference.



An acre of asparagus, Yuma project

## Contracts With Irrigation Districts, Boise Project

THE following contracts have been executed on the Boise project, Idaho, with irrigation districts taking over operation and maintenance, and receiving the benefits of the act of Congress of December 5, 1924 (43 Stat. 672), by which the water users on the Boise project will be enabled to pay the construction charges on a crop return basis: Contract with the Nampa and Meridian Irrigation District dated March 2, 1926; contract with Black Canyon Irrigation District dated April 21, 1926; contract with Boise-Kuna Irrigation District dated March 20, 1926; contract with Wilder Irrigation District dated April 6, 1926; and contract with Big Bend Irrigation District dated March 25, 1926.

These contracts follow generally the same pattern, and that with the Nampa and Meridian Irrigation District will be described, as typical of the whole.

The Nampa and Meridian irrigation district comprises within its boundaries about 40,000 acres of irrigable lands receiving their entire water supply from the irrigation works constructed by the United States, and about 24,500 acres of old water-right land, of which all but approximately 2,000 acres is irrigated from the Ridenbaugh Canal owned and operated by the district. By contract dated June 1, 1915, and amended November 15, 1918, the district had purchased from the United States water rights for the 40,000 acres of project land, at an agreed price of \$70 per acre, payable in 20 annual installments. In the same contracts the district had purchased supplementary stored water rights for the old water-right lands of the district. By previous contracts the district had also taken over the operation and maintenance of the part of the project system within the district.

The act of December 5, 1924, permitted the payment of construction charges on a crop return basis; that is, the individual water user instead of paying his proportionate part of the project construction charges in 20 years as required by the act of Congress of August 13, 1914 (36 Stat. 686), was to be permitted to make payment of the construction charge in an indeterminate period of years, depending upon the crop returns from the land, as ascertained by the Secretary of the Interior. Each year 5 per cent of the gross crop return is payable to the United States. Subdivisions (a), (b), and (c) of article 5 of the contract are quoted in full, so as to show in detail the method fixed for the payment of the construction charges on a crop return basis:

### CONSTRUCTION PAYMENTS 5 PER CENT AVERAGE GROSS ACRE INCOME

(a) The installment of the construction charge per irrigable acre of project lands in the district payable each year shall be 5 per cent of the average gross annual acre income (as determined by the Secretary) for the 10 calendar years first preceding the year in which such installment comes due of the area of project land in cultivation in the district as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive.

### DISTRICT LANDS AVERAGE GROSS ACRE INCOME

(b) The Secretary will determine the average gross acre income from said lands for the 10 years preceding the year 1925, and will notify the district of his findings thereon, and of the charge per irrigable acre based on 5 per cent of the said average gross acre income, and it is agreed that the annual construction installments for the project lands of the district shall be on the basis of the said rate per irrigable acre as determined by the Secretary multiplied by the number of irrigable acres as said irrigable acreage is shown on the official farm unit plats on the Boise project, until modified by notice from the Secretary of his findings in regard to average gross acre income for said project lands of the district during future years, and the district will pay each year to the United States (in addition to the payments provided for in article 11 hereof) as the construction charge on account of the said project lands of the district a sum determined by multiplying the rate per acre determined in the manner stated above by the total number of irrigable acres of project lands in the district (except lands described in article 11 hereof), which charges shall be assessed accordingly by the district to the project lands therein. Said annual payments shall continue until the full construction charge of \$70 per irrigable acre of project lands in the district, plus any amounts added thereto on account of interest or penalties and any amounts added thereto under subsection L of section 4 of said act of December 5, 1924, on account of any due and unpaid construction or operation and maintenance charges added to the total obligation as provided in said subsection and other items provided for under articles 9 and 10 hereof have been fully paid by the district to the United States.

### FUTURE ANNOUNCEMENTS AFFECTING CONSTRUCTION PAYMENTS

(c) After the close of each year hereafter the Secretary will notify the district in writing of his findings in regard to the average gross acre income for the project lands of the district for that year, and the average for the 10-year period including such year and the 9 preceding years unless the Secretary shall find the average gross acre income for such year to be so near the average last determined as to make no material difference in the rate previously determined, in which event the rate last determined and stated by the Secretary shall continue. The failure of the Secretary to state his findings in regard to the average gross acre income for any future year will be construed as equivalent to a finding by the Secretary that the average gross acre income for such year is the same as the average of the last preceding 10 years and that the rate last stated will continue.

The contract authorizes the delinquent charges, the operation and maintenance charges for the current year, and the cost of operation and maintenance equipment transferred to the district to be added to the construction charge and paid as a part of same. Any landowner objecting to the change in terms of payment is to be permitted to remain subject to the old terms of payment.

An important part of this contract is that constituting and dealing with the board of control. It was necessary for the districts operating on the Boise project to set up some sort of machinery by which they could jointly manage certain project facilities serving more than one district. For this purpose the district contracts provide in considerable detail for a board of control comprised of representatives from the various districts.

THE following paragraph appearing in the April issue of the Reclamation Record 10 years ago is worthy of repetition:

"Marshall Field is said to have won his phenomenal success by remembering but 12 essential business principles: The value of time, the success of perseverance, the pleasure of working, the dignity of simplicity, the worth of character, the power of kindness, the influence of example, the obligation of duty, the wisdom of economy, the virtue of patience, the improvement of talent, and the joy of originating."

## Agricultural Program for Rio Grande Federal Irrigation Project

*Recommendations of economic conference show cotton to be key to situation, and other enterprises are to be developed with this in mind*

L. H. Hauter, Assistant Director of Extension, New Mexico College of Agriculture and Mechanic Arts

**F**ARMERS of the Rio Grande Federal irrigation project met at State College, New Mexico, February 15-16, and at El Paso, Tex., on February 18-19, to decide on a definite agricultural program for the next five years. The program was decided upon after the 13 committees which had been appointed by the farm bureaus had carefully reviewed a mass of data on production, prices, and markets which had been compiled for their consideration.

### COTTON KEY TO SITUATION

It developed early in the conference that cotton production would be the key to the situation, and all committees were kept in close touch with the recommendations that were being developed by the cotton and miscellaneous cash crops committee. Cotton, which occupied less than 1 per cent of the total crop acreage on the project in 1919, made up 65 per cent of the total acreage in 1925 and 1926, changing the entire cropping system of the project in less than six years. It became quite evident that the production of any crop, whether a cash or feed crop, could be encouraged only after carefully considering the relative profitableness of such a crop in comparison with cotton, and also after considering the effect that any cropping system might have on soil fertility.

The cotton committee decided, after carefully reviewing all data available, that while the price outlook for the coming year was not encouraging that the farmers on the project could conservatively organize their business on the basis of expecting an average of 15 cents per pound for middling cotton after the surplus crop had been absorbed. They recommended that on this basis cotton should be the major cash crop, but that the soil fertility problem should not be overlooked. They also called attention to the importance of making the project a "one strain of one variety" area in order to secure the premium for the cotton that it deserves.



Guernseys in alfalfa, Rio Grande project

Sugar beets, broomcorn, tobacco, and flax were all passed up as offering no encouragement for the immediate future or as requiring further experimentation before definite recommendations could be made.

### INCREASE IN FEED CROPS

It was pointed out that alfalfa, which a few years ago was the principal cash crop, had ceased to be a surplus crop during the past two years and that only about one-fourth of the grain consumed on the project in 1926 was home grown. Although there appeared to be no increase in the hay requirements of southeastern Texas (the principal market for project hay), it was definitely recommended that sufficient alfalfa be produced to feed all farm animals and that at least one year out of four cotton land be in alfalfa. It was felt that the latter recommendation was desirable from the standpoint of crop rotation. It was also recommended that only the best grades of alfalfa be sold and other grades be consumed on the farm. Cooperative marketing and Federal inspection were also to be encouraged.

Corn was considered the most satisfactory grain and fodder crop, and it was recommended that each farmer produce all the corn for grain, fodder, and silage that is needed for his own farm, but that corn should be grown as a cash crop only when the farmer can expect a yield of 50 to 55 bushels per acre. The small grains were not encouraged except for farm needs for feed and pasture.

### FEED PRICES HIGH FOR LIVESTOCK PRODUCTION

The livestock committees were unable to give much encouragement to increased livestock production on the project due to the shortage of and high price of feeds. It was recommended, however, that sufficient hogs be produced for farm consumption and that there be some increase beyond this looking toward supplying the local markets. Attention was called to the fact that hogs could be farrowed in February and placed on the market in August and September when receipts are low and prices are high, thus giving an advantage which partially offsets the high price of feed.

The feeding of cattle and sheep on an extensive scale could not be recommended on the present outlook for feeds and stock. However, the farm flock of sheep was to be given some encouragement and some feeding was suggested to utilize waste feeds.

Milk production has been on the whole-milk basis, and it was not felt that milk could be profitably produced at a butter-fat basis unless there should be a material reduction in feed costs.

Poultry producers are also faced with high feed costs. The poultry committee felt that eggs could be profitably produced only on the basis of quality eggs which bring a premium. Since the quality egg market in El Paso appears to be fairly well saturated, the committee recommended that the feasibility of shipping quality eggs to eastern markets



be investigated since climatic conditions for production of eggs during the high price season are very favorable. However, until it has been definitely demonstrated that this was feasible, the committee did not feel that they could recommend any increase in poultry production since they did not feel that project producers could compete with ordinary farm or storage eggs shipped in from cheap grain areas.

#### LIMITED EXPANSE IN FRUITS AND VEGETABLES

Because of an increased production of winter apples throughout the United States, the committee did not recommend any increase in the winter varieties but indicated a field for limited expansion in early summer and fall varieties. No increase in peach production was recommended although a limited increase in the pear and grape production of the lower part of the project was recommended.

In the case of truck crops, it was indicated that immediate expansion should be with those crops that have established themselves on the market and are making good returns to the grower. Some increase in the cabbage, tomato, and cantaloupe production was recommended, provided we secure rigid inspection so that only good quality products are shipped.

The possibility of developing a mixed car vegetable business on the project was especially stressed by the committee. It was pointed out that there are hundreds of towns that are eating very few vegetables because they are not available

in small lots and they are unable to use an entire car of one vegetable. Many vegetables produce well on the project and can be placed on the market when the demand is good, so with the proper marketing facilities truck production on the project might be materially increased on this basis. The desirability of establishing several small canneries on the project to take care of the local market demands was also stressed.

### Water Users Power Plant Wins Praise

*Much of the electric current which has supplied light and power in Yuma during the period of the recent storm came from the water users' power plant at Siphon drop. At times this plant carried the entire Yuma load when the southern Sierras was out of business on account of storm interruptions. Current was available when needed and service was good. The new power plant is a great asset to the Yuma project.*

#### LAND AND CREDIT REQUIREMENTS

Although tenancy on the project has increased materially since 1920, it is pointed out that most of the tenants are endeavoring to make homes and are not detrimental to the best interests of the project. In fact, it was recommended that prospective purchasers rent land for a year before purchase is made, and that

preferably the first purchase be small. It was recommended that before purchasing land the farmer should have at least 50 per cent of the purchase price of land, livestock, and equipment if he is to farm efficiently. Greater use of Federal farm loans and Federal intermediate credit loans was suggested, the latter to be secured through the cooperative marketing association. Contracting farm products for the purpose of borrowing money was condemned because of the high cost of such credit.

#### HORSE PREFERRED TO TRACTOR

After reviewing the relative costs of horse and tractor labor, the horse and tractor committee favored the use of horses in general on farms of the project.

\* \* \* \* \*

The conference, which proved highly successful, was suggested by A. C. Cooley, agriculturist in charge of demonstrations on reclamation projects, last November, and was decided upon after the matter had been discussed with a number of farm leaders on the project. In view of the fact that the project is located in two States, the New Mexico College of Agriculture and Mechanic Arts and the Texas College of Agriculture and Mechanic Arts cooperated in compiling the information necessary for the various committees. Valuable assistance was also given by L. M. Lawson, superintendent of the Rio Grande Federal irrigation project, who furnished much valuable information, and by the various department workers who assisted in compiling the data reviewed by the various committees before making their recommendations.

A full report of the committees of recommendations along with some of the information used in reaching their conclusions will be issued in bulletin form at an early date.

### Cotton Production on Irrigation Projects

Statistics compiled by the Bureau of Reclamation, Department of the Interior, show that last year cotton was grown on nearly 210,000 acres on five Federal irrigation projects in the States of California, Arizona, New Mexico, and Texas, producing 166,000 bales of 500 pounds each, and 160,000,000 pounds of seed valued as a whole at \$13,764,585, or \$65.59 an acre.

The largest area devoted to the crop, amounting to 83,337 acres, was on the Rio Grande project, New Mexico and Texas. The largest production, amounting to 31,317,200 pounds of lint and



Cotton 2½ months old

62,634,400 pounds of seed, came from the Salt River project in Arizona, which also had the highest total value of the crop, amounting to nearly \$6,000,000, and the highest value per acre, amounting to \$74.46. These yields and total value were followed closely by the Rio Grande project, New Mexico and Texas, although the per acre value of the crop was nearly \$12 less. Long-staple cotton was grown on the Salt River project on 18,686 acres. Complete statistics are given in the accompanying table.

Cotton grown on Federal irrigation projects, 1926

Project	Acreage	Unit of yield	Yields				Value	
			Total		Average per acre		Total	Per acre
			Lint	Seed	Lint	Seed		
Salt River.....	79,465	Pound.....	31,317,200	62,634,400	394	788	\$5,916,841	74.46
Yuma.....	29,155	do.....	12,545,672	25,091,344	430	860	1,656,032	56.80
Orland.....	279	do.....	36,000	72,000	129	258	15,187	54.43
Carlsbad.....	17,615	do.....	6,378,840	17,234,000	362	978	967,113	54.90
Rio Grande.....	83,337	do.....	32,680,800	55,376,000	392	664	5,209,412	62.51
Total.....	209,851		82,958,512	160,407,744	395	764	13,764,585	65.59

## Land Settlement in Italy

**T**HE Roman Campagna is a large domain in close proximity to Rome, Italy, and represents an area much larger than many provinces of the Kingdom. Its development and settlement have engaged the attention of the Italian Government for a number of years.

The first sanitary improvement law was passed in 1878, and provided particularly for the drainage of marshes and pools, the linking up of springs, and the agricultural improvement of a belt of land within a radius of about 6 miles from the center of Rome. In 1883 reclamation was declared compulsory on all owners of land within the belt described, and if owners were unwilling or unable to meet the requirements of this act, the penalty of expropriation was imposed. In 1903 provision was made for financing improvement schemes for which the owners themselves were responsible. Loans were made by the Government for this purpose bearing 5 per cent interest and repayable in 50 years. This and later legislation brought 110,000 acres under compulsory reclamation. From 1910 to the beginning of the World War, villages and centers of agricultural settlements were established. Such centers contained not less than 25 families, so that domestic water, sanitation measures, schools, and other community improvements could be carried out. New settlers were provided with land by the Government by expropriation proceedings.

### FINANCIAL AID TO SETTLERS

Following the war more comprehensive measures were adopted to intensively settle the Campagna. A large number of villages were established and settlers were granted not to exceed 37½ acres (15 hectares) of land. To accomplish this special loans were granted for the construc-

tion or repair of houses, farm buildings, and farm roads, and to supply water for irrigation or domestic use or for any other work of permanent land improvement or transformation. Loans were made to landowners on development plans submitted by themselves, examined and approved by the Government authorities. The interest on these loans is 2½ per cent, and they are repayable in 45 years. From 1907 to 1924 loans aggregating more than \$22,000,000 were approved. At the present time the Government is empowered to grant loans of not exceeding \$6,000,000 annually.

This development supplies Rome with fresh dairy products, vegetables, and fruits, and provides homes for a vast number of agricultural workers.

Within recent years this form of credit has provided electricity for pumping and for other home uses, and also has provided large modern machinery for breaking up sod land and subsoiling. These community enterprises add to the efficiency of the small landowner and give him the enjoyment of modern conveniences.

### LARGE AREA UNDER DEVELOPMENT

The extension of development and settlement of the Roman Campagna has been carried on successively until it includes 470,000 acres of land. Consideration has been given to extending this development to include Pontine marshes which would bring the total area of planned development and settlement up to 770,000 acres.

An idea of how intensively this development is carried out and the amount of money required to establish settlers may be had from the figures given on 146 farm holdings made available by expropriating in 1922. They were granted to settlers at actual cost at an average of \$240 an acre and provision was made for loans up to



Furrow irrigation

\$400 an acre to facilitate farm development and the establishment of settlers on the land.

The original 110,000 acres have been divided and resubdivided until now they comprise 4,655 separate holdings. This is an average of about 23 acres per farm. In this domain are about 200 tracts having areas from 65 acres to 1,125 acres which are being cut up under a vigorous closer settlement policy in which long-time credit and a low rate of interest encourage farm development. The division of the Government entrusted with this important work renders a high type of public service by providing rural education, sanitation, community organization, and all other factors necessary to promote agricultural prosperity and the contentment of the tiller of the soil.

### *Agents Show Proper Mixing of Bordeaux for Potatoes*

**P**ROPER mixing of Bordeaux has almost as much to do with its effectiveness as the amounts of the constituents used, and has much more to do with the ease of application, according to a recent press release from the Department of Agriculture. In order that potato growers may get better results with this spraying material, county agents in many localities have been giving mixing demonstrations, in which the results of different ways of combining the lime and copper sulphate were shown on a small scale in glass jars, the same proportions being used as in actual practice.

Bordeaux mixture for diseases and insect enemies of potatoes, as recommended by the United States Department of Agriculture, is made up of 5 pounds of copper sulphate (blue vitriol) and 5 pounds of freshly burned lime in 50 gallons of water. The copper sulphate is dissolved and the lime slaked separately and then the two are mixed. Putting the two materials together in concentrated form at once materially affects the physical properties of the spraying mixture. Improper mixing also causes difficulties in spraying.

Copper sulphate dissolves best if put into a bag and suspended in water. In making the lime milk a little hot water should be poured on first until the lime becomes active and then cold water is added slowly as the lime slakes until a fairly thin white liquid results. In mixing the lime milk and the copper sulphate solution at least one of them should be fairly dilute. In making up the final mixture in small amounts the solution of copper sulphate should be poured into the

## *Report on Sacramento Valley Project*

**P**LANs for an irrigation project embracing a gross area of 277,000 acres in the Sacramento Valley in California have just been presented in a report to the Bureau of Reclamation by Engineer W. R. Young.

The project would include the construction of the Iron Canyon storage dam 152 feet high near Red Bluff, Calif., and a main canal some 120 miles in length extending from a division dam just below Red Bluff to a point about 16 miles south of Colusa. Except for a 7,000-acre tract east of the river near Red Bluff the irrigable area stretches along the foothills of the Coast Range west of the Sacramento River in Tehama, Glenn, and Colusa Counties for an air-line distance of about 100 miles, with an average width of  $4\frac{1}{2}$  miles.

The investigation on which this report is based was undertaken by the Bureau of Reclamation in cooperation with the State of California and the Sacramento Valley Development Association. Construction of a storage dam at the Iron Canyon site was proposed in 1920 in connection with a high-line irrigation canal planned to divert water directly from the reservoir. On account of the high cost per acre estimated for this development, further studies of a low-line canal with incidental power development were urged, resulting in the present report.

The water supply for the project would be derived from the 10,000 square miles of Sacramento River watershed above the reservoir site. The dam as planned would be a concrete structure raising the water surface 152 feet above low-water level and impounding 1,121,900 acre-feet of water, sufficient to cover the 60 square miles of land area in the District of Columbia to a depth of 29 feet. This water when released from the reservoir would pass through the turbines of a 110,000-horsepower hydroelectric plant to be built at the foot of the dam, generating electrical energy to be sold for irrigation pumping and for power and lighting purposes throughout the lower

lime milk. If the process is reversed a thick, heavy sediment is formed which will not pass readily through the spraying machine nozzle.

At the demonstrations many potato growers found that they had been mixing the wrong way and decided to change their methods.

### *Land Settlement in New South Wales*

*More than 8,000,000 acres of land had been assigned to returned soldiers by the States of New South Wales up to June 30, 1926, and a total of £17,850,000 had been expended either in advances for improvements or for carrying out projects for irrigation or other public works designed to increase the value of such lands. Under the terms of the returned soldiers' act, 9,265 men had received land or assistance, and, of this number, 2,334 transferred, surrendered, or forfeited their holdings. Of the £3,043,486 advanced in money, £859,699 had been repaid on account and principal and an additional £294,649 had been paid on interest account. Repayments of interest and principal were slower during 1925-26 than in the preceding year, but it is thought that the liberal terms granted for repayment of the remaining indebtedness will make it possible for all payments to be made as they fall due. (Sydney Morning Herald.)*

Sacramento Valley. It is estimated that the returns from the sale of this power would return the investment in reservoir and power plant within 25 years, besides providing a surplus which might be applied to repaying the cost of the main canal and distribution system. The total estimated cost of the project is \$56,000,000.

The above estimates are based on the assumption of interest-free money being available in the reclamation fund to be appropriated for this work. As a matter of fact, all the accretions to the reclamation fund for a number of years to come will be required to maintain economical progress on projects already authorized and now under way. With the notable falling off now being experienced in receipts from the public land oil leases, the principal source of income for the reclamation fund in recent years, and the deferment of construction repayments authorized by recent legislation, only a comparatively small amount of money is available for Federal reclamation work, and this will all be absorbed in carrying on construction work already initiated.

# Reclamation Appropriation Act for the Fiscal Year 1928

Approved January 12, 1927

THE following sums are appropriated out of the special fund in the Treasury of the United States created by the act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

Commissioner of Reclamation, \$10,000; and other personal services in the District of Columbia in accordance with "The classification act of 1923," \$142,000; for office expenses in the District of Columbia, \$23,000; in all, \$175,000;

For expenses, except membership fees, of attendance upon meetings of technical and professional societies required in connection with official work of the bureau, \$2,000;

For all expenditures authorized by the act of June 17, 1902 (32 Stats. 388), and acts amendatory thereof or supplementary thereto, known as the reclamation law, and all other acts under which expenditures from said fund are authorized, including not to exceed \$160,000 for personal services and \$25,000 for other expenses in the office of the chief engineer, \$25,000 for telegraph, telephone, and other communication service, \$8,000 for photographing and making photographic prints, \$50,000 for personal services, and \$10,000 for other expenses in the field legal offices; examination of estimates for appropriations in the field; refunds of overcollections and deposits for other purposes; not to exceed \$20,000 for lithographing, engraving, printing, and binding; purchase of ice; purchase of rubber boots for official use by employees; maintenance and operation of horse-drawn and motor-propelled passenger-carrying vehicles; not to exceed \$50,000 for purchase of horse-drawn and motor-propelled passenger-carrying vehicles; packing, crating, and transportation (including drayage) of personal effects of employees upon permanent change of station, under regulations to be prescribed by the Secretary of the Interior; payment of damages caused to the owners of lands or other private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, or maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior, or such officers as he may designate; payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior: *Provided*, That no part of

said appropriations may be used for maintenance of headquarters for the Bureau of Reclamation outside the District of Columbia except for the office of the chief engineer: *Provided further*, That the Secretary of the Interior in his administration of the Bureau of Reclamation is authorized to contract for medical attention and service for employees and to make necessary pay roll deductions agreed to by the employees therefor: *Provided further*, That any moneys which may have been heretofore or may be hereafter advanced for operation and maintenance of any project or any division of a project shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which advanced in like manner as if said funds had been specifically appropriated for said purposes: *Provided further*, That no part of any sum provided for in this act for operation and maintenance of any project or division of a project by the Bureau of Reclamation shall be used for the irrigation of any lands within the boundaries of an irrigation district which has contracted with the Bureau of Reclamation and which is in arrears for more than twelve months in the payment of any charges due the United States, and no part of any sum provided for in this act for such purpose shall be used for the irrigation of any lands which have contracted with the Bureau of Reclamation and which are in arrears for more than

twelve months in the payment of any charges due from said lands to the United States;

Examination and inspection of projects: For examination of accounts and inspection of the works of various projects and divisions of projects operated and maintained by irrigation districts or water-users' associations, \$20,000;

Yuma project, Arizona-California: For operation and maintenance, \$358,000; for continuation of construction of drainage, \$35,000; in all, \$393,000; *Provided*, That the unexpended balance of \$35,000 of the appropriation of \$200,000 for the Yuma auxiliary project, contained in the second deficiency act, fiscal year 1925 (Forty-third Statutes at Large, page 1330), is hereby reappropriated and made available for the same purposes for the fiscal year 1928;

Orland project, California: For operation and maintenance, \$35,000; continuation of construction of Stony Gorge Reservoir, \$605,000; in all, \$640,000;

Grand Valley project, Colorado: For operation and maintenance, \$50,000; continuation of construction, \$30,000; in all, \$80,000;

Uncompahgre project, Colorado: For operation and maintenance, \$145,000;

Boise project, Idaho: For continuation of investigation and construction, Payette division, \$400,000: *Provided*, That of the unexpended balance of the appropriation

(Continued on p. 62)



Spuds and various seeds grown on Minidoka project





White Leghorns grown on a Yuma ranch

for this project for the fiscal year 1927 there is reappropriated for operation and maintenance, Payette division, \$16,000; for investigations, examination and surveys, Payette division, \$16,000; for continuation of construction, Arrowrock division, \$100,000;

Minidoka project, Idaho: For operation and maintenance, reserved works, \$71,000; continuation of construction, \$75,000; in all, \$146,000;

Minidoka project, American Falls Reservoir, Idaho: For operation and maintenance, American Falls water system, \$9,000; for acquiring rights of way, \$8,000; construction of power plant, \$700,000; investigation and construction of gravity extension unit, \$400,000: *Provided*, That none of the said sum of \$400,000 shall be available for construction work until a contract or contracts shall be made with an irrigation district or districts embracing said unit which, in addition to other conditions required by law, shall require repayment of construction costs as to such lands as may be furnished supplemental water, within a period not exceeding twenty years from the date water shall be available for delivery; in all, \$1,117,000;

Huntley project, Montana: Not to exceed \$60,000 of the unexpended balance of the appropriation of \$118,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, page 1166), and heretofore made available for the fiscal year 1927, shall remain available for the fiscal year 1928;

Milk River project, Montana: For operation and maintenance, \$36,800; continuation of construction, \$15,000; in all, \$51,800;

Sun River project, Montana: For operation and maintenance, \$20,000; continuation of construction, Greenfields division, \$37,000; continuation of construction, Gibson Dam, \$1,000,000; in all, \$1,057,000;

Lower Yellowstone project, Montana-North Dakota: For continuation of construction of drainage system, \$100,000;

North Platte project, Nebraska-Wyoming: For operation and maintenance of reserved works, \$75,000; continuation of construction of Guernsey Dam, \$200,000; in all, \$275,000: *Provided*, That of the unexpended balance of the appropriation for this project for the fiscal year 1927 there is reappropriated for continuation of construction of the Guernsey power plant, \$150,000; and for continuation of construction of drainage, \$100,000; in all, \$250,000;

Newlands project, Nevada: For operation and maintenance, \$125,000; continuation of construction, \$64,000; in all, \$189,000: *Provided*, That no part of this amount shall be available for the reconstruction of the Truckee Canal unless a contract in form approved by the Secretary of the Interior shall have been made with the Truckee-Carson irrigation district providing for the payment of the reconstruction cost: *Provided further*, That the appropriation of \$245,000 made available by the Act of June 5, 1924 (Forty-third Statutes, page 415), and reappropriated for the fiscal year 1926 by the act of March 3, 1925 (Forty-third Statutes, page 1167), shall remain available for the fiscal year 1928 for use for drainage purposes, but only after execution by the Truckee-Carson irrigation district of an appropriate

reimbursement contract satisfactory in form to the Secretary of the Interior and confirmation of such contract by decree of a court of competent jurisdiction and final decision on all appeals from such decree;

For the survey and examination of water storage reservoir sites on the headwaters of the Truckee River, investigation of dam sites at such storage reservoirs, examination and survey of lands susceptible of irrigation from waters that may be practicably so impounded, and estimates of costs, reports, and recommendations with regard thereto, \$50,000;

Carlsbad project, New Mexico: For operation and maintenance, \$50,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, \$350,000; continuation of construction, \$400,000; in all, \$750,000;

Owyhee project, Oregon: For continued investigations and commencement or continuation of construction, \$2,000,000;

Umatilla project, Oregon: For operation and maintenance of reserved works, \$10,000 of the unexpended balance of the appropriation for this project for the fiscal year 1927 shall remain available for the fiscal year 1928;

Baker project, Oregon: For commencement of construction, \$450,000;

Vale project, Oregon: For continuation of construction, \$850,000, of which amount not more than \$100,000 shall be available for the purchase of a proportionate interest in the existing storage reservoir of the Warm Springs project, and the unexpended balance of the appropriation for the fiscal year 1927 shall remain available for the fiscal year 1928;

Klamath project, Oregon-California: Of the unexpended balance of the appropriation for this project for the fiscal year 1927 there is reappropriated for operation and maintenance, \$102,000; continuation of construction, \$124,000; in all, \$226,000;

Belle Fourche project, South Dakota: For continuation of construction of drainage, \$125,000: *Provided*, That no part of this amount shall be available unless a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or districts organized under State law providing for payment of construction and operation and maintenance charges by such district or districts;

Salt Lake Basin project, Utah, first division: For continued investigations, construction of Echo Reservoir, Utah Lake control and Weber-Provo Canal, the unexpended balance of any appropriation available for these purposes for the fiscal year 1927 shall be available during the fiscal year 1928;



Okanogan project, Washington: For operation and maintenance, \$65,000;

Yakima project, Washington: For operation and maintenance, \$288,000;

Yakima project (Kittitas division), Washington: For continuation of construction and operation and maintenance, \$2,000,000;

Riverton project, Wyoming: For operation and maintenance, \$55,000;

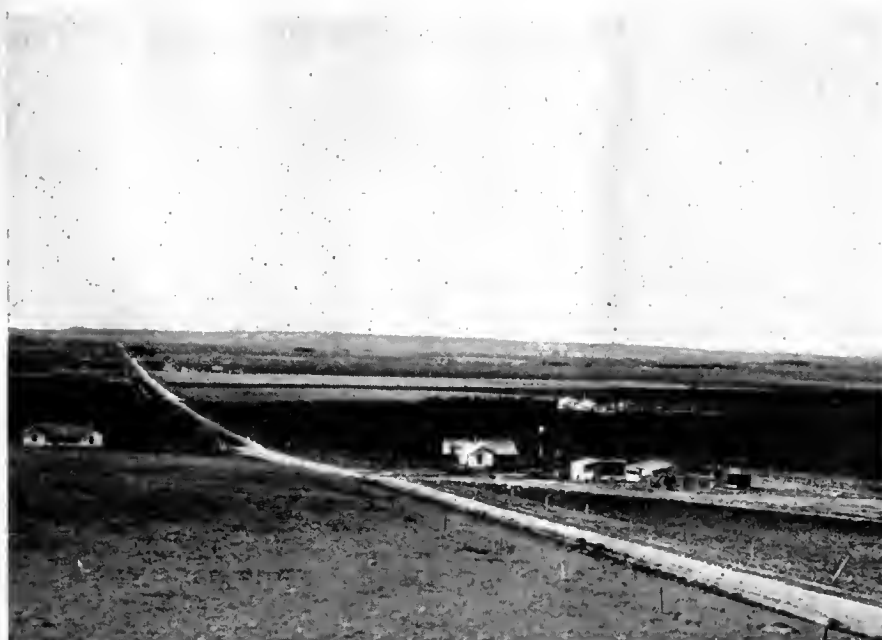
Shoshone project, Wyoming: For continuation of construction of drainage, Garland division, \$150,000: *Provided*, That of the unexpended balance of the appropriation for this project for the fiscal year 1927 there is reappropriated for operation and maintenance of the Frannie division, \$12,500; of the Willwood division, \$10,000; and of the power plant, \$15,000; in all, \$37,500: *Provided further*, That the expenditures in the fiscal year 1928 for operation and maintenance of the Willwood division shall in no case exceed \$20,000, including advances by water users;

Secondary projects: For cooperative and general investigations, \$75,000;

For investigations necessary to determine the economic conditions and financial feasibility of new projects and for investigations and other activities relating to the reorganization, settlement of lands, and financial adjustments of existing projects, including examination of soils, classification of land, land-settlement activities, including advertising in newspapers and other publications, and obtaining general economic and settlement data, \$100,000: *Provided*, That the expenditures from this appropriation for any reclamation project shall be considered as supplementary to the appropriation for that project and shall be accounted for and returned to the reclamation fund as other expenditures under the reclamation act;

Under the provisions of this act no greater sum shall be expended, nor shall the United States be obligated to expend, during the fiscal year 1928, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1928 exceed the whole amount in the "reclamation fund" for the fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual



Pleasant Valley, Interstate Division, North Platte project

conditions an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;

Whenever, during the fiscal year ending June 30, 1928, the Commissioner of the Bureau of Reclamation shall find that the expenses of travel, including the local transportation of employees to and from their homes to the places where they are engaged on construction or operation and maintenance work, can be reduced thereby, he may authorize the payment of not to exceed 3 cents per mile for a motor cycle or 7 cents per mile for an automobile used for necessary official business;

Total, from reclamation fund, \$11,798,800.

For the share of the Government of the United States of the costs of operating and maintaining the Colorado River front work and levee system adjacent to the Yuma Federal irrigation project in Arizona and California, as authorized by the act entitled "An act authorizing the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," approved March 3, 1925 (43 Stats. p. 1186), \$35,000, or so much thereof as may be necessary, to be transferred to the reclamation fund, special fund, created by the act of June 17, 1902 (32 Stats. p. 388), and to be expended under the direction of the Secretary of the Interior in accordance with the provisions applicable to appropriations made for the fiscal year 1928 from the reclamation fund.

For investigations to be made by the Secretary of the Interior through the Bureau of Reclamation to obtain necessary information to determine how arid and semiarid, swamp, and cut-over timberlands in any of the States of the United States may be best developed, as authorized by subsection R, section 4, second deficiency act, fiscal year 1924, approved December 5, 1924 (43 Stats. p. 704), including the general objects of expenditure enumerated and permitted under the second paragraph in this act under the caption "Bureau of Reclamation," and including mileage for motor cycles and automobiles at the rates and under the conditions authorized herein in connection with the reclamation projects, \$15,000.

Barry Dibble, formerly superintendent of the Minidoka project and now consulting engineer at Redlands, Calif., was a recent visitor at the Washington office.

L. E. Mayhall, general superintendent of hatcheries of the division of fisheries, State of Washington, was recently in the Ellensburg office, Kittitas division, Yakima project, to discuss revisions in the design of the proposed fishway at the diversion dam.

District Counsel E. E. Roddis spent several days on the Shoshone project principally in working out a plan for the operation of the works common to the Deaver and Shoshone irrigation districts.

## Organization Activities and Project Visitors

**D**R. Elwood Mead stopped at Iowa City, Iowa, on his way to the Denver conference, points west, and Honolulu, to give an address before the University of Iowa on the development of the Colorado River Basin.

Chief Engineer Walter recently visited Boise, Vale, Owyhee, Gooding, Minidoka, American Falls, and Salt Lake Basin projects.

George C. Kreutzer, director of reclamation economies, made a flying trip to Hollywood, Fla., in connection with the investigation of opportunities for planned group settlement in the South.

C. A. Bissell, chief of the engineering division of the Washington office, spent several days recently looking over properties selected by the States of South Carolina and Georgia with a view to outlining a more intensive economic investigation of the properties later in the year. Mr. Bissell was recalled from the South to assume the duties of Acting Commissioner in Dr. Mead's absence.

Paul J. Leverone, formerly employed in the drafting section of the Washington office and for the past several years in the National Park Service, has resigned after 17 years in the Interior Department to enter a broader commercial field. Friends and well-wishers in the department presented Mr. Leverone with a walrus hide fitted traveling bag.



A Carlsbad apiary

A. B. Richard, ditch rider with auto on the Orland project, has resigned to devote his entire time to farming operations on his project holdings.

Among recent visitors on the Milk River project was C. D. Greenfield, agricultural development agent of the Great Northern Railway Co.

George E. Stratton, former superintendent of the Milk River project, has been transferred to the Lighthouse Service. His headquarters will be in Washington, but he will be in the field a large part of the time. His work will be in the airways division following up construction. He is now engaged on building 20 beacons from Los Angeles to Apex, Nev.

Miss Catherine Keltsch, assistant clerk, has been transferred from the Strawberry Valley project to the Denver office to fill the position formerly occupied by Miss Grace Miller.

Associate Engineer R. G. Hornberger has resigned from the service to return to his home in Cleveland, Ohio. He was employed in the Denver office.

W. C. Paul, of Rupert, Idaho, president of the Minidoka irrigation district, was a recent visitor at the Washington office. He brought with him some fine examples of various kinds of seed grown on the project and a number of big white potatoes, which were distributed among the office force after being photographed.

C. C. Ketchum and D. J. Paul, assistant engineers, have been transferred from the Boise to the Vale project. Charles G. Anderson, junior engineer, has been transferred from the Vale to the Boise project.



Skimming weir and settling basin, Fort Laramie Canal at Whalen Dam

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner George C. Kreutzer, Director of Reclamation Economics P. W. Dent, Assistant to the Commissioner  
W. F. Kubach, Chief Accountant H. A. Brown, Chief of Division of Settlement and Economic Operations C. A. Bissell, Chief of Engineering Division  
C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilds Building

R. F. Walter, Chief Engineer; S. G. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	W. L. Vernon.....	B. E. Stoutemyer.....	Boise, Idaho.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	M. M. Wilson.....	E. E. Roddis.....	Billings, Mont.
King Hill <sup>1</sup> .....	King Hill, Idaho.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Klamath.....	Klamath Falls, Greg.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Billings, Mont.
Lower Yellowstone.....	Savage, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	Do.
Milk River.....	Malta, Mont.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Minidoka <sup>2</sup> .....	Burley, Idaho.....	A. W. Walker.....	H. C. Stetson.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
Newlands <sup>3</sup> .....	Fallon, Nev.....	H. C. Stetson.....	L. H. Mong.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
North Platte <sup>4</sup> .....	Mitchell, Nebr.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Greg.
Okanogan.....	Okanogan, Wash.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Orland.....	Orland, Calif.....	F. A. Banks.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	Portland, Oreg.
Owyhee.....	Adrian, Oreg.....	L. M. Lawson.....	R. B. Smith.....	R. B. Smith.....	Wm. J. Burke.....	El Paso, Tex.
Rio Grande.....	Riverton, Wyo.....	H. D. Comstock.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Mitchell, Nebr.
Riverton.....	Phoenix, Ariz.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Salt River <sup>5</sup> .....	Powell, Wyo.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Shoshone <sup>6</sup> .....	Provo, Utah.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Strawberry Valley <sup>7</sup> .....	Fairfield, Mont.....	H. W. Bashore.....	R. K. Cunningham.....	J. C. Gawler.....	B. E. Stoutemyer.....	Portland, Oreg.
Sun River.....	Hermiston, Greg.....	J. L. Lytel.....	M. J. Gorman.....	E. M. Philebaum.....	do.....	Do.
Umatilla <sup>8</sup> .....	Montrose, Colo.....	P. J. Preston.....			R. J. Coffey.....	Berkeley, Calif.
Uncompahgre.....	Vale, Oreg.....					
Vale.....	Yakima, Wash.....					
Yakima.....	Yuma, Ariz.....					
Yuma.....						

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>10</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>10</sup> .....	Chas. Klingman.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>11</sup> .....	E. R. Mills.....		B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gibson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>11</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Dam site, Elk Creek, Calif.....	H. J. Gault <sup>11</sup> .....	C. B. Funk.....		R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on April 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshute Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

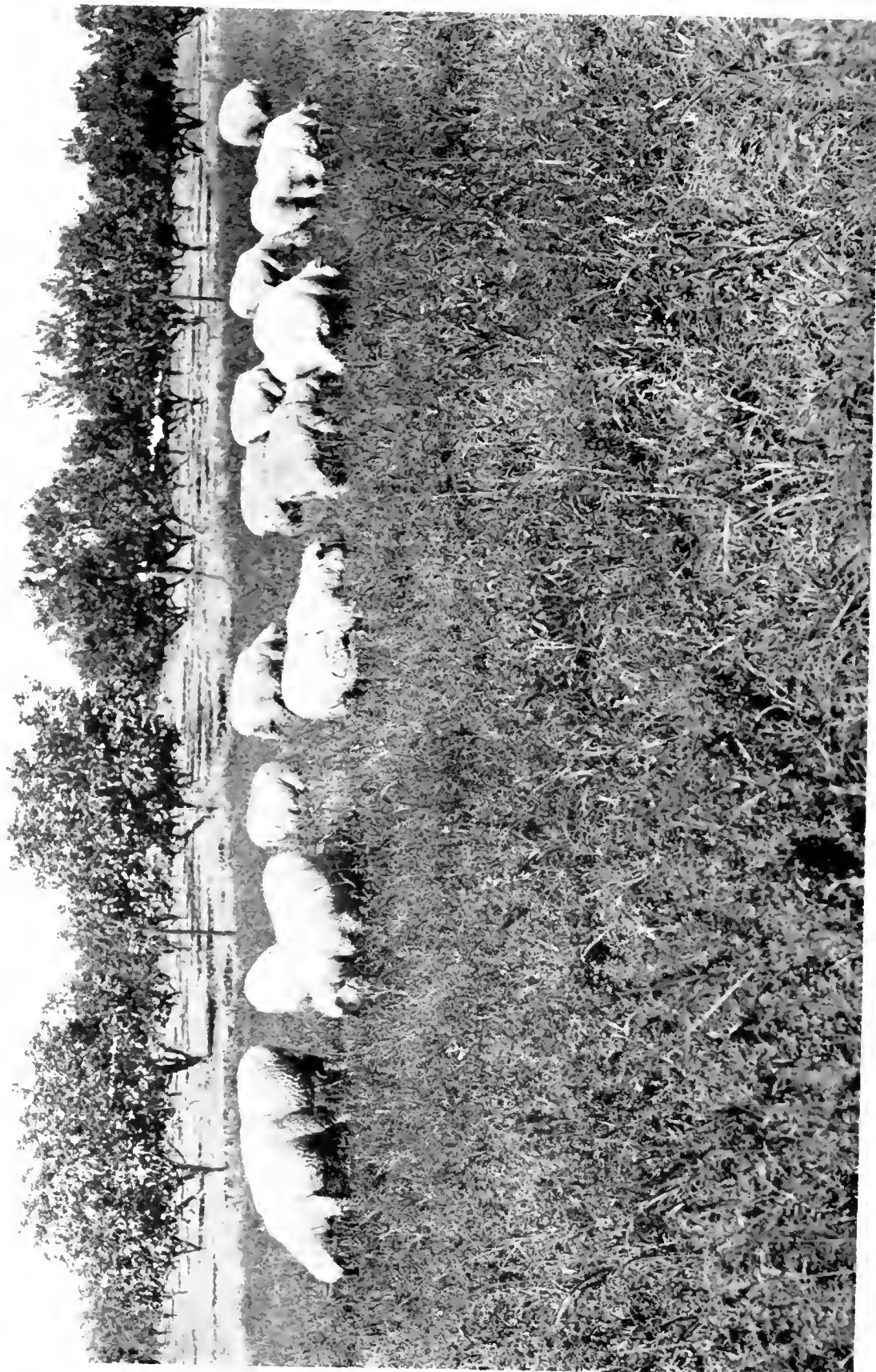
<sup>10</sup> Resident engineer.

<sup>11</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise.....	Boise, Idaho.....	R. J. Newell.....	
Middle Rio Grande.....	Denver, Colo.....	C. C. Elder.....	Middle Rio Grande conservancy district.
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	State of Utah.
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	State of Wyoming.
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



HAMPSHIRE SHEEP GRAZING ON ORLAND PROJECT  
(See page 50)



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# NEW RECLAMATION ERA

VOL. 18

MAY, 1927

NO. 5



GIBSON DAM SITE, SUN RIVER PROJECT, MONTANA





*LET us develop the resources of our land,  
Call forth its powers,  
Promote all its great interests,  
To see whether we also,  
In our day and generation,  
May not perform something to be remembered.*

*—Daniel Webster.*



# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK  
Secretary of the Interior

Price, to others than project water users, 75 cents a year

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

MAY, 1927

No. 5

## *Interesting High Lights on the Reclamation Projects*

**T**HE Farm Economic Conference for Irrigated Land was held at Sidney, Lower Yellowstone project, Montana, April 1-2, under the auspices of the State Agricultural College. Great interest was shown by the farmers, and the various commodity committees did good work in studying production costs and returns realized from the various crops. The resulting recommendations can not fail to improve the agricultural practices on the project. The results of the conference will be published in pamphlet form and made available for all water users. The project office will make a complete report in the near future.

**F**ARMERS on the Lower Yellowstone project who held their lambs until April realized excellent returns, most of the stock being fed having gone to market.

**O**N the Newlands project 96 inches of well-packed snow at the Summit on March 31 gave promise of a good water supply for the coming year.

**D**URING the past season 12,184 cars of apples were shipped from the Yakima project.

**O**N the Lower Yellowstone project the operation and maintenance collections to April 1 were nearly \$25,000 in excess of costs, a condition which has never before existed in the history of the project.

**T**HE Yakima Valley Traffic & Credit Association reports that in the 1926-27 season to March 12 the Yakima Valley shipped 27,138 carloads of fruits and vegetables. Apple shipments totaled 11,765 cars; pears, 4,063; and potatoes, 6,637.

**P**ROJECT Superintendent Lytel reports an acreage under irrigation in the Yakima Valley of 350,000, and places the value of storage properties at \$3,800,000. Forty-eight thousand acres are planted to fruit. There are in the valley cold-storage facilities for 7,000 carloads of fruit. It is estimated that cold-storage construction costs an average of \$500 a carload.

**T**HIS year's crop of grapefruit on the Yuma project was about cleaned up by April 1, 1,400 field boxes having been picked during the preceding month. Sixteen cars have been shipped this season, and next year's crop will probably amount to 75 or 100 cars. New growth started during the month. All orchards seem to be in excellent condition, with a general appearance better than for the past two years.

**T**HE Yuma Mesa reports the largest melon crop ever planted on the project, to April 1, the total acreage in watermelons being 330 and that in cantaloupes, 3,200.

**D**URING the month the Chicago, Burlington & Quincy Railroad Co. and the Great Western Sugar Co. held an exhibit relative to beet culture on the Shoshone project, visiting Powell on the 21st. The exhibits were excellent and greatly appreciated by a crowd estimated at 900 persons. An increased sugar-beet acreage is expected this year, and it is expected that other row crops will be increased, all at the expense of alfalfa.

**T**WO additional applications were received for farm units on the River-ton project during the month and three prospective applicants for homestead lands visited the project.

**A**T American Falls Dam it was expected that the Utah Construction Co. would complete all work under its contract and ship out all plant and equipment during April.

**A** CHECK-UP of new settlers on the Sun River project shows that during the past winter nine new settlers have located on the project, most of them taking land as renters, and in a few cases contracts for sale have been executed on a long term of payment with practically no initial payment being made.

**A** CONSIGNMENT of 30,000 pounds of fig jam, a product of the Orland Kadota Fig Preserving Plant during the 1926 season, was shipped during the month to the United States Forest Service at Missoula, Mont.

**A**T Gibson Dam about 5,000 cubic yards of rock were excavated in the open cut of the spillway-tunnel outlet during the month. At the end of the month the outlet portal of the spillway tunnel had been reached and preparations were being made to go underground.

**O**N March 1, 145 public-land farm units on the Tule Lake division of the Klamath project were opened to entry, and during the month 97 applications were received and referred to the examining board. Nearly 50 applicants were passed by the board.

**T**HE Squire-Dingee Pickle Co. is negotiating with the city of Newell on the Belle Fourche project looking to the erection of a salting station in that city.

# Report of the Reclamation Conference at Denver, Colo., March 16-18, 1927

By R. F. Walter, Chief Engineer, Bureau of Reclamation

A conference of superintendents, district counsel, and others, including several members of the staffs of the Washington and Denver offices of the Bureau of Reclamation, was held at Denver, Colo., Mar. 16-18, 1927.

The tentative program as printed on page 36 of the *NEW RECLAMATION ERA* for March, 1927, was followed with but few exceptions.

The conference was called to order at 9.30 a. m., March 16, by R. F. Walter, chief engineer, who stated that this was the sixth general conference of the engineers of the bureau, previous general conferences having been held at Ogden, Utah, 1903; Washington, D. C., 1905; Yuma, Ariz., 1908; Denver, Colo., 1916 and 1918. Dr. Hubert Work, Secretary of the Interior, was unable to reach Denver in time to permit his attendance at the conference, and in his absence Dr. Elwood Mead, Commissioner of Reclamation, made the introductory speech. He gave the reasons for calling this conference, among them being the fact that during the last two and one-half years important legislation has been enacted vitally affecting the bureau, such as the fact finders' and adjustment acts. These and other legislative acts have changed to a considerable extent the character of the work and have developed complex legal and economic questions. He thought that much good would be accomplished by discussion of these problems.

Following Doctor Mead's remarks the general conference adjourned for the morning and was resolved into numerous small groups whereby the engineers, legal advisers, and accountants could get together to discuss and decide what questions should be brought up at the general conference.

The general conference met again in the afternoon with Mr. Walter, chief engineer, as chairman, and the regular program for the first day, as shown in the March *ERA*, was followed, with the reading of additional papers by H. W. Bashore and L. M. Lawson under item 7, on the subject of "Problems of the Field."

The morning of the second day (March 17) was given over to numerous committee meetings, including the following: "Land Classification, North Platte and Minidoka projects," Messrs. Dent, Bergin, Debler, Stetson, Darlington, Kreutzer, Kubach, Burke, and Mitchell; "Surveys of Projects Requesting Extensions," Doctor Mead, and Messrs. Dent, Walter,

Kreutzer, Lawson, Weber, Preston, Cassteel, L. E. Foster, Lytel, Johnson, Debler, Devries, Coffey, and Offutt; "Hospital Operations," Messrs. Kubach, Bashore, Brown, Roddis, Lawson, L. R. Smith, Lytel, and others who were interested; "Special Administrative Engineering Legal or Economic Problems," which field officials desired to talk over with Washington or Denver office staff; "Special Project Accounting Problems," Messrs. Kubach, Lyman, Meyer, and L. R. Smith, with others especially interested, including Messrs. Banks, Weber, Darlington, Preston, and Youngblutt.

The general conference was resumed on the afternoon of March 17, with P. W. Dent, assistant to the commissioner, as chairman. The topics for discussion were those pertaining to legal and financial matters, and the tentative program as prepared for that day was followed with the exception that the limited time available made it necessary to dispense with the reading of the papers prepared by E. B. Darlington and P. W. Dent, subjects, "Application of Credits under Subsections I and J, Act of December 5, 1924," and "Obligations of Irrigation Districts and Water Users' Associations on Transferred Projects," respectively.

The morning of the third day (March 18) was again given over to committee meetings as follows: "Aerial Surveys, Yakima and Columbia Basin Investigations," Doctor Mead and Messrs. Walter, Lytel, Debler, and Lawson; "Exchange of Entries, Refunds, and Credits, etc.," Messrs. Dent, Kubach, Bergin, Kreutzer, Debler, Offutt, all district counsel, and all superintendents; "Baker Project" and "Kennewick and New Divisions, Yakima Project," Doctor Mead and Messrs. Walter, Lytel, Kreutzer, and M. M. Moulton, secretary of the Kennewick irrigation district; "Kittitas Appraisal," Doctor Mead and Messrs. Stoutemyer, Dent, Johnson, Young, Debler, Kreutzer, Banks, Bashore, Darlington, Offutt, Walker, and F. A. Kern, secretary of the Kittitas reclamation district.

The general program for the third day (March 18) was taken up in the afternoon with G. C. Kreutzer, director of reclamation economics, as chairman, the topics for discussion pertaining to settlement and farm development. B. E. Hayden, being engaged on important field work in Idaho, was not able to present his paper on "Appraisal and Value of Land on New Projects."

Gov. Frank C. Emerson and Senator Francis E. Warren, of Wyoming, held a conference with Commissioner Mead on March 18 to discuss the application of the town of Douglas, Wyo., for purchase of power to be developed at the hydroelectric power plant, under construction at the Guernsey Dam, and to urge inauguration of additional new irrigation projects in Wyoming. Governor Emerson and Senator Warren each spoke briefly to those attending the general conference.

The afternoon session on March 18 closed the general conference, but as none of those attending left Denver until the following day much was accomplished on March 19 by the project superintendents and others in discussing with Washington and Denver office staffs various problems concerning which they were particularly interested.

On the morning of March 19 the following committee groups met for discussion of the several subjects shown: "Land Settlement Meeting," Messrs. Kreutzer, Brown, Youngblutt, Parker, Mitchell, Comstock, Sanford, Johnson, Weber, Banks, Bashore, Stetson, Newell, Young, Lytel, and Darlington; "Uncompahgre Contract," Messrs. Dent, Walter, Debler, L. J. Foster, Alexander, Offutt, Kubach, Bergin, and representatives of water users; "Grand Valley Contract," Messrs. Dent, Walter, Debler, Page, Alexander, Offutt, Kubach, Bergin, Harper, and representatives of the water users.

Representatives of the Grand Valley Water Users Association, Grand Junction, Colo., and the Uncompahgre Water Users Association, Montrose, Colo., were in attendance to discuss the form of new repayment contracts. F. A. Kern, secretary of the Kittitas irrigation district, Washington, was present to discuss land appraisals and other matters pertaining to the Kittitas division of the Yakima project. M. M. Moulton, representing the Kennewick irrigation district, Washington, urged the early construction of that project. A delegation from the San Luis Valley, Colo., discussed with the Secretary and the commissioner the need for a drainage outlet from San Luis Lake to the Rio Grande.

The gathering in Denver of such a large number of the officials of the bureau was made the occasion of several semiofficial meetings. On March 16 the Colorado Section of the American Society of Civil Engineers gave a dinner at the University

Club, at which a number of the project superintendents and others were in attendance. Doctor Mead was the principal speaker. He was followed by P. J. Preston, superintendent, Yuma project, Arizona; F. A. Banks, construction engineer, American Falls Reservoir, Idaho, and Owyhee project, Oregon; L. M. Lawson, superintendent, Rio Grande project, New Mexico-Texas; J. L. Lytel, superintendent, Yakima project, Washington; and W. R. Young, construction engineer, Kittitas division, Yakima project, Washington.

On March 18 the Denver Chamber of Commerce held a luncheon, and again Doctor Mead was the principal speaker. The climax of these semiofficial gatherings was reached on the evening of March 18, when all of the visiting officials were the guests of the Denver office employees at a banquet held in the Olin Hotel, with R. F. Walter, chief engineer, as toastmaster. Dr. Hubert Work, Secretary of the Interior, was present at this affair and gave an informal talk, stressing the solid basis on which the operations of the bureau are now being conducted. The feature event of the evening was an oratorical contest between selected representatives of the engineers and district counsel. By popular vote it was decided that the engineers outtalked the legal men, but this decision may have been influenced somewhat by the fact that the engineers greatly outnumbered the legal men present.

It is the consensus of opinion that the conference was of untold benefit to the service as a whole. There is no question but what the morale of the organization has been strengthened and increased by personal contact. It is believed the results that may be expected as a sequence to this conference, will more than repay the cost thereof, and it was freely expressed that similar conferences should be held at least once every two years.

The papers read at the general conference, or extracts therefrom, will appear in this and subsequent issues of the ERA.

A list of those attending the conference, other than Denver office employees, follows:

#### WASHINGTON OFFICE

Elwood Mead, Commissioner of Reclamation.  
Porter W. Dent, assistant to commissioner.  
George C. Kreutzer, director of reclamation economics.  
William F. Kubach, chief accountant.  
Hugh A. Brown, chief, division of settlement and economic operations.  
Frank J. Bergin, attorney.  
W. A. Meyer, fiscal inspector.  
C. A. Lyman, fiscal inspector.

#### FIELD OFFICES

##### *Project Superintendents or Construction Engineers*

F. C. Youngblutt, Belle Fourche project, Newell, S. Dak.  
L. E. Foster, Carlsbad project, Carlsbad, N. Mex.  
J. C. Page, Grand Valley project, Grand Junction, Colo.  
H. M. Schilling, Huntley project, Ballantine, Mont.  
H. D. Newell, Klamath project, Klamath Falls, Oreg.  
H. A. Parker, Lower Yellowstone project, Savage, Mont.  
H. H. Johnson, Milk River project, Malta, Mont.  
E. B. Darlington, Minidoka project, Burley, Idaho.

A. W. Walker, Newlands project, Fallon, Nev.  
H. C. Stetson, North Platte project, Mitchell, Nebr.  
Calvin Casteel, Okanogan project, Okanogan, Wash.  
R. C. E. Weber, Orland project, Orland, Calif.  
L. M. Lawson, Rio Grande project, El Paso, Tex.  
H. D. Comstock, Riverton project, Riverton, Wyo.  
L. H. Mitchell, Shoshone project, Powell, Wyo.  
G. O. Sanford, Sun River project, Fairfield, Mont.  
L. J. Foster, Uncompahgre project, Montrose, Colo.  
J. L. Lytel, Yakima project, Yakima, Wash.  
P. J. Preston, Yuma project, Yuma, Ariz.  
F. A. Banks, Owyhee project, Adrian, Oreg.  
W. R. Young, Kittitas division, Yakima project, Ellensburg, Wash.  
H. W. Bashore, Vale project, Vale, Oreg.

#### *District Counsel*

E. E. Roddis, Billings, Mont.  
W. J. Burke, Mitchell, Nebr.  
J. R. Alexander, Montrose, Colo.  
R. J. Coffey, Berkeley, Calif.  
H. J. S. Devries, El Paso, Tex.  
B. E. Stautemyer, Portland, Oreg.

## *Taxes Take One-third of Colorado Farm Rents*

State and local property taxes took over 33 per cent of the net income from rented farms in Colorado during the year 1925. This represents a slight decrease in the proportion of rent taken by taxes as compared with 1923, but a marked increase in the tax burden as compared with 1919. The figures are based on a survey by the Colorado State Agricultural College and the United States Department of Agriculture.

Property taxes on 568 Colorado farms reporting such taxes for 1925 averaged 61 cents an acre. Gross rents on these farms averaged \$2.30 an acre and net rent before the payment of taxes, \$1.84.

Reports for 1923 were received from 414 farms. Their gross rents averaged \$2.25 per acre, net rents before taxes were paid averaged \$1.80 an acre, and taxes 68 cents per acre. Taxes in 1923 amounted to nearly 38 per cent of the net income.

The situation in 1919 was more favorable. Two hundred and eighty-two farms reported gross rents averaging \$3.07 per acre; net rent, \$2.64; and taxes, 60 cents an acre. Taxes that year took slightly less than 23 per cent of the net income from the farms.

**H**EAVY snows prevailed on the Gunnison and Uncompahgre watersheds, Uncompahgre project, during March, and the present indications are that an excellent water supply will be available for the 1927 season. The watersheds were in an unfrozen condition prior to the time the fall snows began, and as a result it is anticipated that much of the precipitation now in the hills will be held over in storage for the late summer supply.



STONY GORGE DAM, ORLAND PROJECT, MARCH 26, 1927

Left to right: C. A. Templeton, H. A. Brown, J. J. Flaherty, E. M. King, Garnett King, W. G. Elliott, W. J. Donald, Dr. Elwood Mead, George R. Freeman, W. A. Beard, Joseph Simon, R. C. E. Weber, J. N. Cook, H. J. Gault, W. G. Gurnett, George Strum, Dr. Hubert Work

## Gibson Dam, Sun River Project, Montana

By Byrum W. Steele, Engineer

THE Gibson Dam, contract for the construction of which has been awarded to the Utah Construction Co., is now under construction. The dam site (see opposite page) is located about 80 miles west of Great Falls, Mont., on the North Fork of Sun River, a tributary to the Missouri River. The dam will be of the massive concrete arch type. It will have a crest length of approximately 900 feet and a maximum height of 195 feet. Augusta is the nearest railroad point and is the terminus of the Great Northern Railway branch line from Great Falls. The distance from Augusta to the dam site is approximately 23 miles, the greater part of the distance being over rolling country. About 3 miles below Gibson Dam site is the Sun River diversion dam, which is the point of diversion of all water for the 90,000 acres of the irrigable land of the Sun River project lying north of Sun River.

In order to obtain electric power for the operations connected with the construction of the dam, the contractor has built about 28 miles of transmission line from the Montana Light & Power Co.'s line to Augusta.

Excavation for the base of the dam and the spillway were started as soon as the electric power was available, early in December, 1926. The rock to be excavated is a fine-grained limestone, which near the surface is badly weathered. The construction program contemplates completing all excavation for the dam and spillway by August, 1927, after which time concrete will be poured as far into the winter as the weather will permit. During the winter of 1927-28 it is contemplated that work at the dam will be largely suspended, since it would not be economical to place concrete during the winter months in this climate.

The spillway is located in the north abutment and provides for a discharge of 50,000 second-feet by means of an uncontrolled circular lip discharging into a vertical shaft and in turn into a horizontal tunnel leading to the river level below the dam. Provision has been made in the design so that drum gates may be installed on the spillway lip at some later date, thus increasing the storage capacity of the reservoir from 90,000 to 105,000 acre-feet without raising the crest of the dam above the elevation provided for in the present contract. The spillway will be concrete lined throughout, the intake, outlet, and shaft lining being reinforced. The horizontal or tunnel portion of the spillway will be lined with plain concrete.

River diversion while the base of the dam is being constructed in the river section will probably be accomplished through an adit driven into the spillway tunnel above the dam. Temporary openings through the base of the dam at low-water level will be provided to accommodate floods during construction that are too large for the tunnel adit to handle without overtopping the structure. These openings will be closed by filling with concrete and the surfaces of contact thoroughly grouted after the dam is otherwise completed and the tunnel adit plugged.

The outlets for irrigation water will be placed through the central portion of the dam near the downstream water level and will be controlled by two 60-inch balanced needle valves. These valves will be supplemented by high-pressure emergency gates 5 feet square. The openings through the dam from the trash rack structure to the valves will be lined with semisteel conduit lining.

Concrete materials will be secured from deposits along Sun River below the dam site. The mass concrete for the main body of the dam will include cobbles ranging in size from 2½ to 8 inches in diameter. The computed maximum stress in the dam is a little over 600 pounds, and the strength of the mass concrete is expected to show at least 2,000 pounds per square inch at 28 days.

Construction joints radial to the upstream face of the dam will be placed at intervals of 30 feet above and 60 feet below elevation 4650. Each contraction joint will be provided with a drainage well 6 inches in diameter and a copper sealing strip to prevent leakage through the joint. These drainage wells will be connected at the base of the dam to the drainage system described in the next paragraph.

An elaborate system of drainage will be installed in the dam to relieve uplift pressure both in the foundation rock under the dam and in the dam itself. This system will consist of 4-inch metal pipes in the upstream cut-off connecting the drainage holes drilled in the foundation to 6-inch horizontal pipes leading to the downstream side of the dam. Connecting to these same 6-inch horizontal pipes 3-inch vertical concrete drains will be located 3 feet from the vertical upstream face of the dam. These drains, as well as the grout pipes, will be located at intervals of 5 feet, the grout pipe being upstream from the drainage pipe. The grout holes will be drilled after the upstream cut-off has been excavated and as

soon as the grouting of the foundation has been completed the drainage holes will be drilled into the foundation rock through the 4-inch drainage pipes placed in the cut-off for that purpose. As soon as the drainage holes are drilled the upstream leg of the drainage pipe will be plugged.

## Record Cotton Production

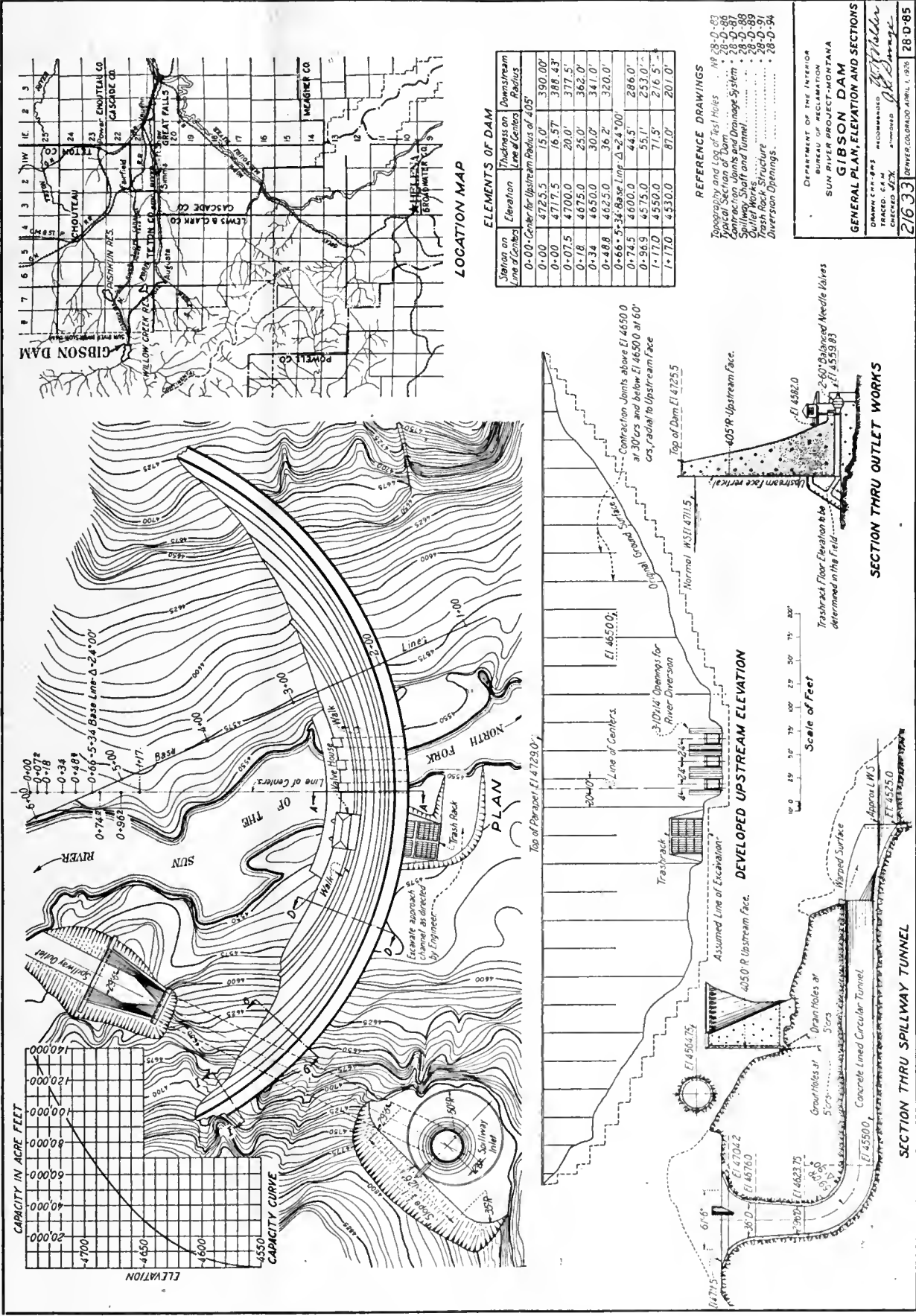
*The world's record cotton production on a small acreage is believed to have been accomplished in the Yuma Valley during the past year, it became known recently, when two Yuma Valley cotton farmers made affidavit that they had grown 6,505 pounds of lint cotton on 3½ acres of land located in the Yuma Valley. The land was located on West Fifteenth Street and the farmers are J. R. Bertrem and T. C. Welch. Six thousand five hundred and five pounds of lint cotton will make 13 bales of cotton averaging 500 pounds each, with 5 pounds to spare. It will also average almost four bales of cotton to the acre. In order to be certain about the yield, the two men had the patch of cotton carefully measured as to space, and by reason of their crop are now claiming the world's record. (Yuma Morning Sun.)*

## Pumping From Wells Aids Seeped Areas

In the Salt River Valley of Arizona, as well as at a number of other places in the West, excessive irrigation, resulting in deep percolation, together with seepage from canals, has unfitted large areas for cultivation by reason of the raising of the ground-water level. These areas have increased rapidly in extent until corrective measures have become imperative.

Test borings in the Salt River project showed that about half of the project is underlaid by a coarse, water-bearing formation from which water may be pumped; and, as the Salt River Water Users' Association had available a large quantity of cheap electric power generated at its own plant, it was decided to install electric-driven pumps in wells located in the damaged areas to lower the ground-water level. This plan has been successful; water-logged land has been reclaimed; the rise of ground water in sections not yet damaged has been checked, and the pumped water has been used very largely to augment the supply available for irrigation.





(See opposite page)

## Irrigation District May Make Payment to Agent to Represent District Before Congress on District Business

THE case of Crawford v. Imperial Irrigation District, decided by the Supreme Court of California January 31, 1927 (253 Pac. 726), deals with the power of an irrigation district, organized under the laws of California, to employ an agent to appear before the various committees of Congress to present facts and arguments in favor of the Swing-Johnson or Boulder Canyon Dam bill. The district contracted to pay such agent at the rate of \$250 per month, and a taxpayer of the district questioned in court the authority of the district to make such a contract.

The court, after finding that the contract was not contrary to public policy, as it would be if it provided for the use of sinister or personal influence upon the Members of Congress, proceeds to the discussion of the more important question, whether the making of such a contract was ultra vires the district.

The court points out that the statute under which the district was organized authorizes the board of directors of an irrigation district to "enter into, and do any acts necessary or proper for the performance of, any agreements with the United States, \* \* \* for the joint acquisition, construction, leasing, ownership, disposition, use, management, maintenance, repair, or operation of any rights, works, or other property of a kind which might lawfully be acquired or owned by the irrigation district, and may acquire the right to store water in any reservoirs or to carry water through any canal, ditch, or conduit not owned or controlled by the district." Sections of the code authorizing the district to construct dams and reservoirs and to expend money for the protection of the district's canal system were also quoted.

The purpose of the Swing-Johnson bill before Congress was the construction of a dam across the Colorado River at Boulder Canyon, and the flood protection of the lands on the lower reaches of the river, including the territory of the Imperial irrigation district.

The court upheld the power of the district to employ an agent to present the facts in favor of the Boulder Canyon Dam before the committees of Congress. The court says:

In order to perform these duties and execute the powers thus given to the board of directors of the irrigation district, it is apparent that it may be necessary for the board to adopt some means of bringing to the attention of the United States Government or other Governments with which the district may wish to enter into contracts, the subject matter of the pro-

### Sixteen Per Cent Profit on 7-Acre Orange Grove

*It is estimated that the net profit on a valuation of \$10,000 will be shown this year on 7 acres of young orange trees on the Orland project, according to information furnished by George A. Barceloux at a recent banquet given by the Orange Growers' Association. This profit will be realized on the 10-acre tract sold recently by the Bank of Orland to Frederick Evans, a Navy man, for \$10,000. The tract lies north and east of the W. W. Allen and Lindstrom orchards, 4 miles from town.*

*Two years ago the bank took over this property from the owner, who considered it a losing proposition. The orchard was in bad shape, the trees being not over 6 feet in height and the weeds almost as high. The bank secured the services of W. W. Allen, a successful orchardist.*

*Barneyard manure and cover crops were the only fertilizer used on the place. Although it is a 10-acre tract, there are actually only 7 acres in oranges, the rest being planted to family orchard and lemons, the latter being budded over this year by the new owner to navels.*

*A year ago 300 lug boxes of Valencias and 865 boxes of navels were taken off and sold through the local association, netting the bank 7.9 per cent on the \$10,000 investment. This year, 1,354 lug boxes of navels were delivered to the packing house, and a conservative estimate of 400 lug boxes of Valencias has been made. Prices for the two years were approximately the same.*

*This profit comes from young trees, far from full bearing, and from trees that until the past two years had indifferent care. Mr. Evans will have the orchard cared for by Mr. Allen until he retires from the Navy, when he plans to come to Orland and make his home on the fine producing acreage. (Orland Register.)*

boards may be understood by the officials charged with the consideration of such matters: \* \* \*

The Swing-Johnson bill authorizes the construction of a dam in the Colorado River at a point in or near Boulder Canyon, and also the construction of a canal from the Laguna Dam in said river to the lands of the Imperial irrigation district. The dam and canal are to be built according to the terms of said bill by the United States Government, and the former is to be paid for by revenues to be derived from the leasing of power privileges incident thereto and the latter by the lands to be benefited thereby. This case was submitted in its entirety upon an agreed statement of facts. This statement recites at some length the problems of the Imperial irrigation district and its efforts to secure an adequate water supply for the use of its inhabitants for irrigation and domestic purposes, and protection of the district from the flood waters of the Colorado River. \* \* \*

The district is not financially able to construct said dam and canal, and, if it were able, it has no authority from the United States or the States in which said dam would necessarily have to be located to build said dam. From these facts it appears that the only means whereby said district can hope to obtain a supply of water for irrigation and domestic purposes and to secure protection from destruction of the lands therein by the flood waters of the Colorado River is through a contract with the United States Government. It is the object and purpose of the Swing-Johnson bill to enable the Government to enter into such a contract with the district. The purpose of employing Mr. Fly and sending him to Washington is to enable the district through him to present the facts bearing upon the subject matter of the proposed legislation before the committees in Congress having this bill under consideration. We think it is plainly within the powers of the board of directors of said district to furnish to Congress all the information in its possession which might tend in any manner to enlighten the members of that body upon the pending bill, and, if in the judgment of the board of directors this can best be done by having a representative of the district appear personally before the committees of Congress, then in our opinion said board of directors is authorized to employ and send to Congress such a representative.

WE regret the omission of the Woman's Page this month, which has been occasioned by the numerous added duties placed upon the associate editor. Miss Schnurr is now in the West attending, in her capacity as secretary, an informal meeting of the Commission on the Equitable Use of the Waters of the Rio Grande. Later she will accompany Doctor Mead on a visit to several of the projects. We hope to resume her helpful articles in next month's issue.

posed contracts. It also seems apparent to us that occasions may arise when it will be absolutely necessary in the best interests of the district that it be represented in person before the proper boards or instrumentalities of these Governments in order that the claims of the district as to the matters before these

# Important Construction in progress during 1927 and proposed for 1928 by the Bureau of Reclamation

By R. F. Walter, Chief Engineer

## THE BUREAU PROGRAM

Appropriations made available by the last Congress for the Bureau of Reclamation for the fiscal year 1928, including carry-over funds estimated at \$2,175,500, total \$14,049,300, as against a total of \$15,082,862 for the present year.

This comparison is of little significance, however, as the expenditure of a large part of the appropriation for 1927 has been delayed pending execution and confirmation of repayment contracts. A considerable part of the 1927 appropriation is therefore carried over to 1928 and next year's expenditure will be much larger than during 1927 or other recent years. In each year's total all of the appropriation is from the reclamation fund, except \$35,000 for the Yuma project levee maintenance and \$15,000 for investigation of swamp and cut-over lands in seven Southern States, which are from the General Treasury. The 1928 program includes \$2,130,300 for operation and maintenance of constructed projects and power plants; \$277,000 for examination and surveys, including \$75,000 for survey and reports on secondary projects; \$50,000 for investigations on the Upper Truckee River in Nevada and \$100,000 for economic investigations; and \$11,642,000 for construction.

This construction appropriation is divided by principal features as follows: Storage, \$5,933,000; canal system, \$3,465,000; drainage and flood protection, \$1,323,000; power development, \$877,000; and miscellaneous construction, including telephone and permanent improvements, \$43,500.

In addition to the above appropriation for 1928, the bureau program included \$300,000 for a pumping plant to tide over seasonal water shortages on the Okanogan project; \$500,000 for continuing the construction of the Pilot Butte Canal on the Riverton project, estimated to cost \$1,000,000 when completed; \$100,000 for completion of reconstruction of the Truckee Canal on the Newlands project, and a reappropriation of \$106,000 for the Deadwood Reservoir on the new Payette project, in the second deficiency bill, which failed to pass before Congress adjourned.

## THREE DAMS WILL BE COMPLETED THIS YEAR

The present year will witness the completion of the American Falls Reservoir on the Snake River in Idaho, exclusive



High-grade Holstein heifers, Fort Shaw division, Sun River project

of the proposed power development; the Guernsey Reservoir and power plant on the North Platte River in Wyoming; and the McKay Reservoir on a branch of the Umatilla River in Oregon.

## THE AMERICAN FALLS RESERVOIR

The American Falls Reservoir has a capacity of 1,700,000 acre-feet and was estimated to cost \$8,500,000, or \$5 per acre-foot. About half of the capacity has been acquired by private projects in the Snake River Valley requiring supplemental water supply, and the other half will be available for the proposed north unit of the Minidoka project and the Gooding project. Funds were advanced for the construction cost on account of storage capacity contracted by the private projects before construction was authorized.

The Government retained the potential power privilege which will result in an installation of a 40,000-horsepower development largely required in connection with the proposed irrigation of 100,000 acres in the Minidoka north side pumping unit, which lands lie above the present north side gravity unit of that project.

The estimated cost of the installation of this power development, in four units, is about \$3,000,000. The cost of the installation of one unit of 10,000 horse-

power, together with the tailrace excavation and other joint construction required for all four units, is about half this amount. As but \$700,000 is available in the 1928 appropriation, no power can be made available without an additional appropriation. Under the circumstances, unless the power developed can be contracted in advance, at a fair return during the 10-year period prior to its requirement for the Minidoka north side pumping division, it will not be good business to make this investment until just before the power is needed.

The construction of this reservoir required the purchase and removal of a large part of the town of American Falls, the purchase of some 56,000 acres of agricultural and grazing lands which are flooded thereby, the removal of 2 miles of the Oregon Short Line Railroad and subordination of a large power plant.

The dam consists of a concrete overflow section 95 feet high and 650 feet long, a concrete gravity section 2,400 feet long, and low earth embankments 1,800 feet long. The dam was constructed under contract by the Utah Construction Co. At this time it appears, regardless of the fact that the low bid on the dam was \$250,000 in excess of the engineers' estimate therefor, that the cost of the reservoir, when completed in July, will show a cost for storage capacity nearly 10 per

cent less than the engineers' estimates. Some water was stored during 1926 and at present it appears that full storage will be obtained this year.

#### THE GUERNSEY RESERVOIR

The Guernsey Dam, an earth and rock fill structure, which will be completed during August, is 100 feet in height, with a top length of 600 feet. The capacity of the reservoir is 70,000 acre-feet, but on account of its strategic location, just above the heads of the main canals irrigating the valley, it will fill two or more times each year. Two 2,400 kv.-a. power units are being installed. The dam and power house are being constructed under contract with the Utah Construction Co. The estimated cost of the reservoir and the two-unit power development is \$2,350,000. The completed cost will vary but little from the engineers' estimate. Water is now being stored for this year's use.

#### THE MCKAY RESERVOIR

McKay Reservoir, about 8 miles from Pendleton, Oreg., has a capacity of 75,000 acre-feet, and is formed by the McKay Dam, having a height of 160 feet and a length of 2,600 feet. The dam is constructed of gravelly material with a heavy reinforced concrete face connecting with bedrock. This dam was constructed by Government forces. The engineers' estimate of cost of the reservoir was \$2,500,000. The work, except for the installation of the control valves, on which

(Continued on page 73)

## What A Modern Creamery Means To an Irrigated Farming Community

UNTIL the fall of 1924 the dairy business on the Shoshone project was a very uncertain one. Not that there were no cows, but the market was not satisfactory. There was a creamery at Powell and other agencies purchased cream, but for some reason neither the dairy farmer nor the creamery were making expenses.

In October, 1923, William Castberg, a young man with considerable experience in both the manufacturing and selling of dairy products, purchased the Farmers Cooperative Creamery, then closed to business, for \$1,000. He knew before starting that he would have the same competition that had played an important part in making the cooperative creamery a failure; that human nature was the same on the Powell Flat as in any new dairy, territory in that many farmers would sell their cream to the party paying the most for their dairy products, regardless of the best interests of the community.

During the three and one-half years that Mr. Castberg has been managing the creamery at Powell he has made many changes both in the interior and exterior of the building, which is 40 by 70 feet. The grounds which comprise a little over an acre have been so changed during the past three years that it would be difficult to recognize the property if it were not for the surrounding landmarks. Handy driveways, flanked by bluegrass lawns,

now lead from the main highway to the creamery. On each side of the driveway is a white-painted rail fence and last year 135 Iowa ash trees were set out to increase the attractiveness of the premises.

Since the Powell Creamery has been under the present management three different sets of machinery have been installed, the last being an up-to-date electrically operated churn and Pasteurizer. The capacity of this modern equipment is about 1,000,000 pounds of butter per year. In addition to this major equipment the creamery has its own ice plant with a capacity of 4 tons every 36 hours, and the latest machinery used in making ice cream. Seven motors are used in operating the various machines. With natural gas, city water, electricity, telephone, and the Chicago, Burlington & Quincy Railroad for transportation, all that remains to make a creamery a success is the addition of cows.

When Mr. Castberg became manager of the Powell Creamery the dairy cow was not considered very valuable property. At sales three years ago dairy cows sold for from \$35 to \$70. To-day it is not unusual for a good dairy cow to sell for over \$100. Recently a registered Holstein cow sold for \$175. Through the assistance of the county agent young dairy stock is being shipped to the project.

The first year under the present management the Powell Creamery made 46,000 pounds of butter, the second year 72,000 pounds, and last year 162,000 pounds, and it is estimated 225,000 pounds will be manufactured this year in addition to about 7,000 gallons of ice cream.

A market has been the least of Mr. Castberg's troubles. During the tourist season, butter and ice cream are sold in large quantities to the Cody Inn, a hotel owned and operated by the Chicago, Burlington & Quincy Railroad. The chief reason that the Powell Creamery products are in demand is the fine quality of butter and ice cream put on the market. The neat and sanitary condition of the entire plant and premises is the best "ad" possible.

Along with the growth of the dairy business the poultry, turkey, and hog industry has increased and prospered. This is due to using the skim milk and buttermilk to the best advantage.

The following example of what thrift means to a settler on the Powell Flat should be of interest:



Creamery on the Shoshone project, Wyoming



About the time of the close of the World War a settler purchased two registered heifer calves and a registered Holstein bull. In 1926 the increase from this small start netted this man \$1,212 for his cream alone, besides the dairy products for his family, the increase in the number of his herd, the by-products for his poultry and hogs, and the manure for the upkeep of the fertility of his farm.

In February, 1927, the Powell Creamery purchased 9,600 pounds of butterfat, manufactured 11,700 pounds of butter, and 165 gallons of ice cream. The dairy business has just started. When the 12,000 acres of new land on the Willwood are farmed and the vacant tracts in the Powell and Deaver districts settled, it is safe to say there will be a cheese factory added to the present Castberg Creamery.

### Construction in Progress, 1927

(Continued from page 72)

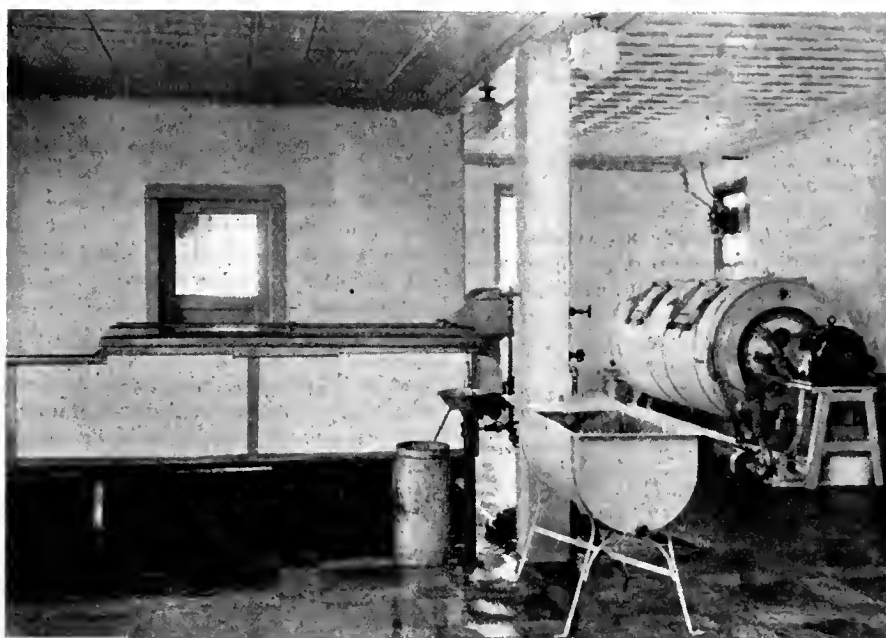
the delivery was delayed by the manufacturers but which are now being installed, was completed several months ago. The actual cost when completed will not exceed \$2,150,000, or \$350,000 less than the engineers' estimate. Water is now being stored and will be available for use during the present year.

### THREE POWER PLANTS TO BE COMPLETED THIS YEAR

On the Yuma project a power plant of two units, capable of developing 2,200 horsepower at maximum head, was completed during last August at a cost of \$285,000 and has since been in operation. The sale of the surplus power, after supplying the project demand for pumping of irrigation water to the Yuma Mesa and drainage water from the valley drain, will net the project at least \$35,000 per year until more power is needed for project uses.

A sixth power unit is now under construction at the Minidoka Dam on the Minidoka project, which will be completed before July 1, at a cost of \$200,000. This installation will increase the project power output by 3,500 horsepower, most of which is required for project uses during the summer.

The first unit of the Guernsey power plant on the North Platte project will be completed about July 1, 1927, and the second unit a short time later. Each unit will develop 3,400 horsepower, under a head of 65 feet. All of the power from the first unit is sold and the gross revenue will be \$150,000 per year.



Electrically operated churn and pasteurizer, Castberg Creamery, Powell, Wyo.

### FIVE PROJECT DIVISIONS TO BE COMPLETED THIS YEAR.

Other important construction which has been or will be completed during the present year includes the Orchard Mesa unit of the Grand Valley project, which irrigates 10,000 acres, at a cost of \$1,000,000; the Langell Valley unit of the Klamath project, except 6 miles of drain, irrigating 12,000 acres at a cost, including the drainage, of about \$930,000; the first or Pavillion unit of the Riverton project, irrigating 20,000 acres; the Tule Lake unit, irrigating 10,000 acres in the Klamath project; and the Willwood unit of the Shoshone project, having an irrigable area of 15,600 acres. With the exception of about one-half of the area in the Orchard Mesa and one-third in Langell Valley and Tule Lake projects, these tracts are as yet uncultivated and require settlement by experienced farmers with sufficient capital for development work.

### THE GIBSON DAM NOW UNDER CONSTRUCTION

Contracts for two important dams were awarded during the year. The Gibson Dam on the Sun River project is located in the Sun River Canyon about 3 miles above the diversion for the Greenfields main canal, and the reservoir created thereby will have a capacity of 105,000 acre-feet and furnish a supplemental supply for 90,000 acres of the Sun River project, of which the distribution system has been completed for about 40,000 acres. This dam will be of the concrete

arch type 200 feet in height and 900 feet crest length.

The contract for the dam was awarded to the low bidders, the Utah Construction Co., on September 13, 1926, for \$1,566,240 as against the engineers' estimate of \$1,827,435. There were seven bids submitted. The estimated cost of the reservoir complete is \$3,000,000. Work is now in progress on foundation excavation. The dam will be completed during 1929.

### THE STONY GORGE DAM UNDER CONSTRUCTION

The Stony Gorge Reservoir on the Orland project in California will have a capacity of 50,200 acre-feet, and is being constructed as a supplemental supply for 20,000 acres, now under irrigation in the project, at an estimated cost of \$1,230,000. The dam consists of an Ambursen type structure 120 feet in height and approximately 1,000 feet long. Contract for the construction of this dam was awarded to the Ambursen Construction Co. on October 2, 1926, for \$518,904, as against the engineers' estimate of \$609,524. There were 14 proposals received. Excavation for the foundation is now in progress, and the dam will be completed during 1928.

### SIX NEW PROJECTS ARE AUTHORIZED

During the past year repayment contracts were completed and construction began on three new projects or divisions, namely, the Kittitas in Washington, and the Owyhee and Vale projects in Oregon. During this year it is anticipated repayment contracts will be completed and



actual construction inaugurated on three additional new projects, namely, the Echo Reservoir for the Salt Lake Basin project in Utah, and the Gooding and Payette projects in Idaho. These six new projects will cost \$50,000,000, and irrigate or furnish supplemental water, as is the function of the Echo Reservoir, to 435,000 acres. Of the \$50,000,000 estimated cost, \$4,000,000 is represented by the cost of storage and works already available, and \$10,000,000 is included in the appropriations for 1927 and 1928 now available, leaving a total of \$36,000,000 to be provided for these six new projects by appropriations during the 1929 and subsequent fiscal years.

#### **THE OWYHEE DAM, THE HIGHEST YET CONSTRUCTED**

From an engineering and construction standpoint this program is exceedingly interesting. It includes what will be at this time the highest dam in the world, the Owyhee, which will be in excess of 360 feet in height, depending on the depth of excavation required for the foundation, which is now being drilled in the canyon about 20 miles above the junction of the Owyhee with the Snake River. Alternate designs for this dam are now under preparation for study, but it is probable that the site is best adapted to an arch type concrete structure. The cost will exceed \$6,000,000, or about one-third of the total cost of the Owyhee project. Advertisement will probably issue this fall. It will require three years to construct.

#### **OTHER IMPORTANT DAMS NOW BEING DESIGNED**

The storage of water required for these six new projects will involve, in addition to that on the Owyhee above described, a 2-mile outlet tunnel, 70 feet below the present water surface of Lake Cle Elum in Washington, and a long low embankment raising the present water surface 10 feet to make available a storage capacity of 500,000 acre-feet needed in part for the Kittitas project and other lands in the Yakima Valley at a probable cost of \$5,000,000; a concrete dam 100 feet high on Deadwood River, a branch of the Payette for the Payette project at an estimated cost of \$1,100,000; and an earthen dam, 125 feet high and 1,800 feet long, on the Weber River, at a cost of some \$2,000,000 for the Great Salt Lake Basin project. This last design is completed.

#### **STORAGE REQUIREMENTS FOR NEW PROJECTS**

The combined storage capacity of these four reservoirs is 1,269,000 acre-feet, the estimated cost of which is \$15,000,000, or about \$12 per acre-foot.

Storage in addition thereto is already available in the Warm Springs Reservoir, having a capacity of 170,000 acre-feet, of which one-half interest has been purchased for the Vale project, at \$8 per acre-foot and in the American Falls Reservoir, in which 400,000 acre-feet of capacity, representing a cost of \$5 per

acre-foot, has been reserved for the Gooding project.

#### **CANAL SYSTEMS FOR NEW PROJECTS**

Some 16 miles of concrete-lined tunnels,  $4\frac{1}{2}$  miles of steel siphons under hydrostatic heads up to 350 feet, and several miles of concrete bench flumes and siphons will be involved in the construction of the 350 miles of main canal required for these six new projects, the cost of which will exceed \$25,000,000. Parts of the main canal construction for the Owyhee, Vale, and Kittitas projects are the most difficult and expensive yet undertaken by the bureau, with the possible exception of that of the main canal of the Tieton project. The funds appropriated and available during 1927 and 1928 for these canal systems are \$5,780,000, largely for the Kittitas and Vale canal construction. The construction of the first section of the Kittitas canal has been in progress since last July under contract with the United Construction Co.

#### **DRAINAGE CONSTRUCTION**

During the past few years, due to catching up with the seepage condition on many of the old projects, comparatively little drainage construction has been in progress. With the execution of new repayment contracts on several projects on which the seepage condition is becoming serious, there will be renewed activities on this feature. The program for 1928 provides funds for some 250 miles of drain, and includes beginning construction on a \$1,000,000 system for the Belle Fourche project, a \$525,000 system on the Lower Yellowstone project, a \$450,000 system for the Warm Springs district on the Vale project, completion of a \$950,000 system on the Newlands, a \$60,000 drain for the Langell Valley division of the Klamath project, and a \$335,000 system on the Huntley project, as well as continuation of excavation of drain extensions as required by seepage conditions on the Yuma, Boise, Minidoka, Grand Valley, Sun River, and Rio Grande projects, and for the Garland division of the Shoshone, and the Fort Laramie division of the North Platte projects.

Except for continuation of the work already authorized on old projects and for the drainage work for the Warm Springs district, which, on account of special conditions, has been authorized by Government forces, all drainage, as well as other large construction, will be advertised and contracted, if reasonable bids are received. Heretofore, on account of difficulties in adequately covering changing conditions



An Orland project farm residence

in contracts, drainage work has been done by Government forces and the Lower Yellowstone drainage will be the first to be advertised.

#### PLANS AND SPECIFICATIONS UNDER PREPARATION FOR ISSUE OF ADVERTISEMENTS

In connection with the Owyhee Dam and later for use in the tunnel construction for this project, it is proposed to construct 25 miles of construction railroad from Adrian, Oreg., to the dam site. This railroad will be necessary to transport the sand and gravel which must be secured along the Snake River and cement and other construction materials and supplies from the Union Pacific Railroad. It is also proposed to make connection with the power lines of the Black Canyon power plant on the Payette River in order that Government-owned power may be available for this large construction program during the five or more years that will be required for this work. This will require the construction of some 50 miles of high-voltage transmission line. Surveys have been completed, preparation of plans and specifications are in progress, and advertisement for the railroad and part of the power line construction should issue in the near future.

The design of the Owyhee Dam, which will be the highest yet constructed, is largely dependent on the results of the diamond-drill borings which are now in progress with three drill rigs at this site. It is hoped to secure complete information thereon to enable determination of its type

and final location in the canyon by July 1, and that designs and specifications may be completed and advertisement issued during the coming autumn. About \$1,000,000 is now available for the dam, besides the funds required for railroad, power line, and camp construction and purchase of flooded lands in the reservoir site.

The Echo Reservoir will require the reconstruction of some 5 miles of the Park City branch of the Union Pacific Railroad and an equal length of the Lincoln Highway, which will be flooded thereby, at an estimated cost of \$600,000. This will be the first construction undertaken under the proposed contract which it is expected may be advertised at a very early date. Plans and specifications for the dam and road work are practically ready for printing.

The award of contract for the second section of the main canal of the Kittitas project, for which 15 bids were received at the time of opening on December 28, is now pending. The low combination bid on this canal construction was \$728,539, as against an engineers' estimate of \$921,031. Plans and specifications for advertisement of a third section of this canal, involving a cost close to \$1,000,000, are under preparation and advertisement will issue this spring, to be followed by advertisement for a fourth large section during the summer.

On April 12 bids will be opened for the construction of a 5-mile section of the main canal of the Vale project, involving an estimated expenditure, including cost

of cement and material, of some \$250,000. This will be followed by advertisement for a second section of the canal, involving some \$700,000 expenditure, during the present summer.

Surveys will be inaugurated for final location of the main canal for the Gooding project, for which \$400,000 has been appropriated about April 15, in order that the advertisement for the first section may issue as soon as repayment contracts are executed and confirmed by the court.

Considerable preliminary work will be required before plans and specifications for the Deadwood Dam for the Payette project, for which \$400,000 has been appropriated, can be made ready for advertisement. Preparatory work thereon will probably require all the present summer, as the site is isolated and at a high altitude where the working seasons are short.

Plans and specifications are under preparation for advertisement of drainage construction on the Lower Yellowstone project, for which \$165,000 is available. This advertisement should issue at an early date.

### Mr. Bissell Inspects Southern Properties

C. A. BISSELL, chief of the engineering division, Bureau of Reclamation, Washington, D. C., left Washington on April 4 for a preliminary investigation and inspection of a number of tracts of land in the South, with a view to reclamation and planned group settlement. Before returning to Washington, about the 1st of June, Mr. Bissell plans to visit tracts of land at Mayland, Tenn., Hattiesburg, Miss., Selma, Ala., Fort Lauderdale, Fla., and Pembroke, N. C.

The following will be associated with him in making the inspection and investigations: George R. Boyd, drainage engineer, Bureau of Public Roads; S. L. Jeffords, agronomist, Clemson College, S. C.; and a soil technologist.

Colonel Fly is again on his "Beloved Yuma Mesa" after another winter in the National Capital. Although painfully and critically ill the greater part of the season, he labored untiringly for the Yuma project and sought the passage of legislation which would materially benefit the entire Nation. He returned to the West happy in the realization of success attained so far as Yuma is concerned and optimistic for the early passage of the more important legislation.



Whalen diversion dam and Interstate Canal head gates, North Platte project

# Preparation of Appropriation Estimates for the Budget<sup>1</sup>

By William F. Kubach, Chief Accountant, Bureau of Reclamation

## APPROPRIATION ESTIMATES FOR THE BUDGET

I ASSUME that this topic was assigned in order that the project officials may become more familiar with the Budget procedure now required.

The Budget and Accounting Act of 1921—the act providing for the establishment of the national Budget system—worked a revolution in the manner in which the estimates of appropriations needed for the conduct of the Government are formulated and submitted to Congress. Under the old system estimates were prepared by the heads of the several spending agencies who, in framing them, gave no consideration to the financial situation and prospects of the Government as a whole. Although these estimates were reviewed by the department heads, they still represented the desires of the spending agencies, which sought to secure the maximum appropriation possible. From the departments and independent establishments the estimates were sent to Congress through the Secretary of the Treasury. That officer acted merely as a compiling agency, without authority to revise the estimates or to express an opinion regarding their desirability. No comparison was made of the estimates with probable revenues with a view to determining the extent to which the requests for funds exceeded resources available for meeting them.

Under the new system the spending departments are prohibited from making any direct requests upon Congress for funds. Instead, their requests must be submitted to the President, upon whom is placed the full responsibility for the formulation and submission to Congress of a consolidated statement of what authorization, in his opinion, should be made for expenditures for the ensuing fiscal year. An estimate of prospective revenue accompanies the estimates of proposed expenditures and the two are brought into correlation in such a way as to show clearly whether the proposed expenditure program is less than or exceeds the prospective revenue.

In order that the President may discharge the great responsibility placed upon him, provision was made in the Budget and Accounting Act for an organization known as the Bureau of the Budget to act as direct agent of the President. In performing his duties as chief budget officer, the President is not confined to

the mere formulation of the annual Budget but, through the Bureau of the Budget, exercises close control over the expenditures of moneys after they are appropriated by Congress, and through that bureau active steps are taken to secure improvement in the business methods of the Government with a view to keeping down the estimates to the smallest sums consistent with the service to be rendered and of controlling the expending of the moneys placed at the disposition of the departments and independent establishments.

## PREPARATION OF THE BUDGET

The preparation of the Budget involves six principal steps. These are:

1. Announcement of the financial policy.
2. Submission of preliminary estimates.
3. Submission of final estimates.
4. Hearings before the board of estimates of the Bureau of the Budget.
5. Return of estimates to department for revision.
6. The preparation of the Budget document.

By the formulation and announcement of the financial policy is meant the determination of the position to be taken by the administration in respect to such matters as expansion or contraction of the Government's activities. The financial policy is announced by the President at the semiannual business meeting, to which are summoned all the directing personnel of the Government to meet with the President and the members of the Cabinet.

The second step is the preparation of preliminary estimates. These estimates are submitted to the Director of the Budget about July 15 of each year, their purpose being to supply advance information of what a department or establishment contemplates asking for the ensuing year. This explains the call for the preliminary estimates by the chief engineer about June 1 of each year. Heretofore these estimates have been submitted to the Budget in totals for each project. However, a detailed statement explaining the amounts comprising the project totals was submitted to the Budget Bureau with the estimates for 1928 and hearings were held. After study of the estimates has been completed each department is notified of the total amount to which its original estimate has been reduced and is directed to apportion this total in such manner as will best provide for its activities and to prepare its final estimates by

appropriation titles and objects of expenditure as limited by this total.

The third step is the preparation of final estimates of appropriation, estimates of receipts, and estimates of expenditures. These must be submitted to the Budget Bureau on or before September 15 of each year. This step explains our second call upon the projects for the submission of detailed estimates. These estimates are consolidated in the Washington office and, together with statements of past, current, and estimated revenues, and explanation and justification for each item proposed, are submitted through the Budget officer of the Interior Department to the Bureau of the Budget. These estimates are prepared uniformly throughout the Government service. The details are set forth in accordance with the classification of objects of expenditures prescribed by the General Accounting Office in its Bulletin No. 1, dated May 11, 1922, copy of which has been furnished each project. From the submissions from the projects it is very evident that many of the project officials are not familiar with or do not understand the classification, and a circular has been recently dispatched with request that employees charged with the responsibility of preparing the Budget submission familiarize themselves with the requirements of this bulletin to the end that the classification of expenditures might be uniform.

The fourth step is the hearing before the board of estimates of the Bureau of the Budget, at which time the commissioner is again required to appear before the board and justify each and every item proposed. These hearings are very exhaustive, sometimes extending over several days.

The fifth step is that of returning the estimates for final revision to the department. These revisions involve the correction of not only the estimates of appropriations but also a modification of the expenditure program. No time is given for submitting the revision to the field, and the construction program must be revised as the necessity of the work requires. It is for this reason that reliable information must be at hand in the Washington office in order that intelligent revision can be made, as no time is allowed for referring this question to the field.

The sixth and final step is the preparation of the final Budget. We are engaged upon the Budget from June 1 to Septem-

<sup>1</sup> Address delivered at the Reclamation Conference in Denver, March 16-18.

ber 15 and it requires the continuous effort of several employees. Immediately after the final Budget is submitted we must commence the preparation for the hearings before the Appropriations Committee. To this committee we must make a very complete statement explaining and justifying each and every item proposed for appropriation. The hearings before this committee continue for several days and much information must be assembled in anticipation of just what problems the hearings will develop, and the major part of the information furnished by the projects is for this purpose. I might add that these hearings are also exhaustive.

In the forepart of this paper statement is made that the Bureau of the Budget also controls the expending of the moneys placed at the disposition of the spending agencies. On or before the beginning of each fiscal year each spending agency must make an apportionment of its appropriations to the four quarters of the fiscal year, by appropriation titles, to the Budget officer of the department. Prior to the fiscal year 1927 one apportionment was made for the entire reclamation fund.

This was comparatively easy and it was not necessary to call upon the field offices. However, for the fiscal year 1927 and thereafter the Bureau of the Budget insists on apportionments for each project.

The field offices will be called upon shortly to make a quarterly apportionment of their 1928 appropriation. In making such apportionment each project will be required to set aside a part of each appropriation as a "reserve." Before obligating the appropriation in excess of the quarterly apportionment a waiver will be required, and before obligating any part of the reserve this must be released by the Budget officer of the department, whose actions are controlled by the Director of the Budget. The importance of this apportionment is directed to your attention in order that you may relieve the Washington office of as much embarrassment as possible occasioned by the incurrence of obligations in excess of the quarterly apportionment.

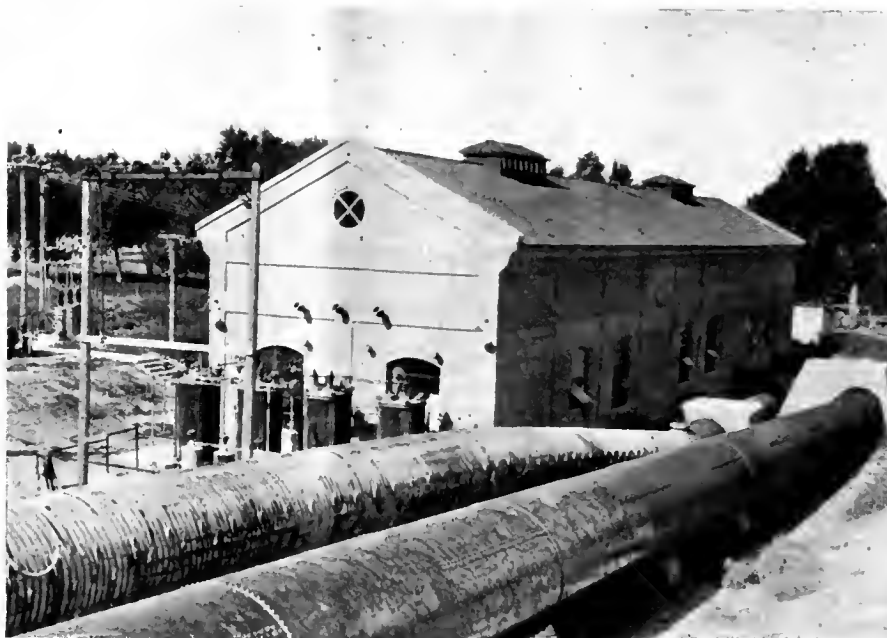
Obligations against appropriations for the field service must be authorized by the head of the bureau or agency in Washington controlling it. In some of the bureaus an authority is issued by its

Washington office for each obligation incurred. You can readily understand how such a procedure would interfere with efficient and economical prosecution of construction and operation and maintenance. It was finally decided that our allotments, when approved by the commissioner, are in fact authority to incur obligations to the extent of the amount allotted, but as the law requires quarterly apportionments it was necessary to call upon the field offices for a quarterly apportionment of the allotments. Later, when determined, we must make another report of the amount of "actual obligations." The amount of "authorized obligations" for a given quarter must not exceed the amount apportioned to that quarter without first securing a "waiver" from the head of the department, and, of course, actual obligations must not exceed the amount authorized. We must depend upon the project offices to watch this, and when it is evident that actual obligations will exceed the amount apportioned to a particular quarter a waiver must be submitted before obligations in excess of the amount authorized are incurred.



Orchards in the Okanogan Valley





Lingle power plant, North Platte project

## The "Home Place" Plan on a Canadian Project

AN article by C. J. Broderick, in a recent issue of *Modern Irrigation*, tells of the troubles encountered by the Lethbridge northern irrigation district in Alberta, Canada, and the steps taken to put the district on its feet. As in the United States, the problem was not one of construction nor of operation, but of repayment of the cost.

"The system had cost \$5,500,000 to construct, and the area of the project was 100,000 irrigable acres. Each acre was assessed \$5.25, \$1.25 of which covered operation and maintenance. The assessment during the first seven years paid the interest and operation costs. After that an additional dollar was to be assessed to retire the bonds in 30 years."

The trouble was that the farmers could not pay \$5.25 an acre. Another difficulty was that the land was held in too large acreages, running from 320 to 1,280. In order to meet the situation the "Lethbridge northern colonization act" was adopted.

"The essence of the legislation lies in the 'home place' plan. Much idle land in the district was held by absentees. More land was held by resident farmers in excess of what could be profitably farmed under irrigation."

The "home place" comprised a unit commensurate with the farmer's ability to make produce. A quarter section was suggested. The "home place" would

pay charges on a schedule spread over 50 years. There would be no reduction in the assessment rate, but the Government would assist the settler, during the early years of development, in meeting his assessment, as follows:

"During the first year in which a home place was registered, the farmer is to pay no rates; the Government will advance the full assessment of \$5.25 on his behalf. In the second and third years the farmer will pay the water service charge of \$1.25 per acre, while the Government advances \$4. In the fourth year, the farmer is assumed to have obtained a start and his proportion will be \$3.25 while the Government pays \$2. Each fourth year thereafter the farmer's proportion advances \$1 until eventually he will be meeting the full assessment. At any time the farmer may pay the full capital cost of \$55 per acre and receive title to his water right.

"This schedule took care of the actual resident producer within the limits of the area granted for a home place, but any surplus land he might have owned had to bear the full assessed rate. The Government had said, 'We will give relief, but not blanket relief.' The man with more land than he could make produce will not be allowed to speculate with it, or keep it idle at governmental expense. If he can not pay on his surplus land, then that surplus goes into the rate en-

## Middle Rio Grande Conservancy District

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$50,000, or so much thereof as may be necessary, to provide for reconnaissance work on the lands of the Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, and Isleta Indians, or so much thereof as may be susceptible of irrigation, lying within the exterior boundaries of the Middle Rio Grande Conservancy District, a political subdivision of the State of New Mexico, but not subject to district assessments, and to enable the Secretary of the Interior to provide for surveys, examinations, and the preparation of plans and specifications, for the reclamation, drainage, and irrigation of said lands and conservation of waters appurtenant thereto, in cooperation with said Middle Rio Grande Conservancy District, said money to be paid from time to time as said work proceeds, such payments, including the salary and expenses of the engineer hereinafter referred to, to be made in proportion to the expenditures heretofore or hereafter made by the district in the ratio that the area of the Indian lands bears to the other lands to be benefited, such expenditures to be subject to the approval of the Secretary of the Interior and to be made under such rules and regulations as may be prescribed by the Secretary of the Interior: *Provided*, That said Secretary, through the Commissioner of Indian Affairs, shall designate an engineer, who shall represent the department in the preparation of said plans and report thereon, and whose salary and expenses shall be paid out of the funds herein authorized to be appropriated: *Provided further*, That said sum or any part thereof that may be expended for this reconnaissance work shall be reimbursable by said Indian lands if and when the participation by the United States in construction of said project is approved by the United States, such reimbursement to be in accordance with the terms of the act of Congress approving such participation: *Provided further*, That the Secretary of the Interior shall report to Congress the results of said reconnaissance work and his recommendations thereon.

Approved, February 14, 1927. (Public, No. 620.)

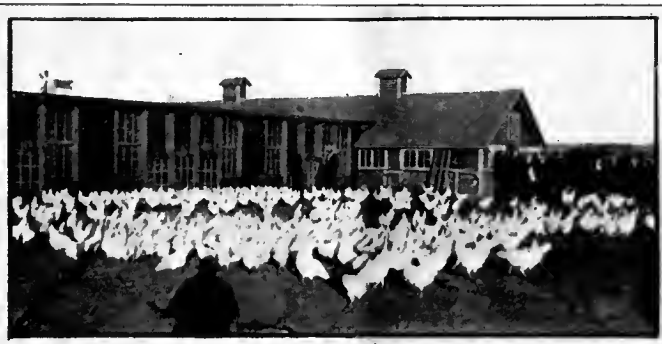
forcement return at the end of two years and becomes the property of the irrigation district for resale to producing settlers."



## Poultry Tour in the North Platte Valley

*Five hundred farmers visit flocks in Scotts Bluff and Sioux Counties where increased interest in poultry raising is due largely to the work of the South Sioux Poultry Association*

*By D. H. Propps, Agriculturist, Mitchell, Nebr.*



Left: Two-year-old hens at Chris Christensen's, who uses these for eggs to hatch in his 7,200-egg incubator. Right: Part of the 1,000 pullets at Jay Eckman's farm whose returns were \$100 to \$130 a week all fall

A NEW record in farm tours was established in the North Platte Valley recently when farmers and poultry growers from Bridgeport to Fort Laramie united in a big poultry tour of Scotts Bluff and Sioux Counties. As many as 60 ears were counted in the line in the afternoon, and it was estimated that at one time or another during the day a total of 500 people participated in the tour and received the benefits of the demonstrations.

Stops were made at nine different farms, where a special study was made of housing and winter egg production. Demonstrations were given showing how old houses had been remodeled and with little expense made into comfortable quarters. Houses that had been cold or damp had been made serviceable and satisfactory by the addition of straw lofts or straw ceilings. New houses of the latest type were inspected and the special advantages pointed out. Owners of flocks visited explained their methods of feeding and care, stressed the advantages of flock records, and told what their flocks were doing for them.

One of the most elaborate houses visited was at the Armstrong poultry farm near Scottsbluff. This house was fitted with electric lights, and running water was provided for the hens at all times. Mr. Armstrong explained the use of lights and gave a short discussion of feeding and management.

### LARGEST FLOCKS IN SHEEP CREEK COMMUNITY

The climax in interest was reached in the afternoon when the flocks in Sheep Creek community, north of Henry, were visited. Most of the flocks in that com-

munity consist of 500 to 1,000 hens. Within a radius of a mile were more than 4,000 hens, from which the owners were marketing \$400 to \$500 worth of eggs a week. In the basement of the farm home of Mr. Christenson was a mammoth 7,200-egg incubator. Mr. Christenson supplies baby chicks to the community and to other farmers in the valley.

John Heinz has one of the largest flocks in the Sheep Creek community. In the demonstration at his farm Mr. Heinz spoke of the importance of proper housing and pointed out the necessity of getting pullets into winter quarters early. The 600 pullets on this farm were accustomed to be confined to the house and of course could not be turned out for the occasion. The tourist admired them from the outside as they made merry in their comfortable quarters.

### STRAW CEILING KEEPS HOUSES WARM AND DRY

Most of the new houses in the Sheep Creek community have straw ceilings, and some of the old houses have had straw ceilings put in this year. The fact was brought out in the demonstrations that the straw not only makes the houses warmer but it also takes up any excess moisture and keeps them dry.

A good example of the effect of a straw ceiling was pointed out in the demonstration at Jay Eckman's farm. His old gable-roofed house was cold and damp last year, with the result that the birds contracted colds and roup. This year the same house with a straw loft is comfortable, and the straw on the floor keeps perfectly dry. So pleased was Mr. Eckman with the straw loft in the old house

that he put a straw ceiling in his new house built last summer.

### HOUSE REMODELED AT LOW COST

One of the most interesting and helpful demonstrations was at the farm of Clark Jones, where an old house 14 feet wide had been remodeled by building out the front, making it 26 feet wide, and adding dormer windows. The total cost of the material purchased for rebuilding the house amounted to less than 50 cents per hen capacity. Only a dozen extra eggs per hen paid for the material used and the hens were comfortably housed.

A small house that needed remodeling badly and got it was used for the demonstration on the farm of J. F. Ray, northeast of Minatare. This house, 20 feet long and 10 feet wide, was 7 feet high in the rear and 9 feet high in front. The one-sash windows were too high for the sun to shine on the floor. The house was so narrow that sufficient ventilation could not be obtained from the front without a draft striking the birds on the roosts. The result was a cold, damp house and more or less trouble with colds. Mrs. Ray stated to the tourists that the moisture sometimes collected on the underside of the roof to the extent that it dripped down, and the straw on the floor was always damp. With a few hours' work and practically no expense for new material, the windows were lowered and muslin shutters made to occupy the spaces left above the windows. False rafters were dropped 2 feet below the roof. On top of these rafters old hog wire was placed and the space above was filled with straw. Mrs. Ray's hens now have a warm and dry house with plenty of light, even though it is still too narrow.

(Continued on page 80)

## Organization Activities and Project Visitors

**SECRETARY WORK** and Commissioner Mead were at Orland on March 26. After a meeting with the owners of unoccupied lands regarding the plan for advertisement and sale of these holdings and following a trip through the irrigated area, the party was taken to Stony Gorge for an inspection of the construction work in progress at the dam. Accompanying the Secretary's party were the following: H. A. Brown, chief of the division of settlement and economic operations of the Washington office; W. J. Donald, secretary to Doctor Work; Garnett King, assistant passenger traffic manager of the Southern Pacific Lines; and W. A. Beard, vice president of the Iron Canyon Project Association.

### *Poultry Tour in North Platte Valley*

(Continued from page 79)

#### **SMALL FLOCKS RETURN GOOD PROFIT**

One of the best-paying small flocks visited was at the Lester Kaasch farm in Lake Alice district. From 215 hens Mr. Kaasch sold last year 2,888 dozen eggs beside what were used at home. The eggs were sold at a premium locally, and the gross returns from this small flock averaged close to \$100 a month for the year. Mr. Kaasch's equipment was modest but convenient and his house was comfortable and dry with plenty of light.

Mrs. John Jensen built a new poultry house last spring 20 by 36 feet. In six and one-half months, from March 12 to the end of September, her 140 Buff Orpington hens had returned her a net income just about equal to the entire cost of the new house. Her net income for October was \$38.85 from 130 hens.

#### **THE SUCCESS OF THE TOUR DUE TO LOCAL ORGANIZATION**

The increased interest in poultry in Scotts Bluff and Sioux Counties is due largely to the work of the South Sioux Poultry Association. In fact, it was the members of this organization who originated the idea of a poultry tour. The ladies of the association served lunch to the tourists at Henry.

The county agents in the valley and D. H. Propps of the office of demonstrations on reclamation projects cooperated with the poultry association in planning and managing the tour.

Representatives of the commercial organizations in the valley participated in the tour and did much to make it a success.

On March 18 all of the visiting officials at the Denver Conference on Reclamation were guests of the Denver office employees at a banquet held in the Olin Hotel, with R. F. Walter, chief engineer, as toastmaster. Dr. Hubert Work, Secretary of the Interior, was present and gave an informal talk, stressing the solid basis on which the operations of the bureau are now being conducted.

Mrs. Florence Robbins is temporarily employed in the Denver office as junior clerk for the purpose of coloring soil classification maps for the Kittitas division, Yakima project.

Julian Alcala Buendia and Procopio Ferreras Eleazar, two students from the Philippine Islands, called at the Denver office several times during the month of March in regard to employment on one of the large construction jobs, and tentative arrangements were made with the construction engineer at Ellensburg, Wash., for their employment later in the season.

A. J. Sheldon, consulting metallurgist for the American Rolling Mill Co., of Middletown, Ohio, was a visitor on the Uncompahgre project from March 21 to 23. He inspected the High Mesa ingot iron siphon and the riveted pipe siphon across Dry Creek. Samples were taken by him for the purpose of making a microscopic examination, and report on his findings has been promised shortly.

W. G. Stewart was employed on the Boise project March 11-17 as an engineer to give expert testimony in the Boise River flood water case.

E. B. Darlington, superintendent of the Minidoka project, and B. E. Stoutemyer, district counsel, visited the Boise project during March.

Hugh L. Crawford, assistant engineer on the Minidoka project, resigned March 31, and was appointed manager of the Burley irrigation district.

W. A. Meyer, accountant and auditor in the Washington office, was on the Sun River project from February 28 to March 8.

J. R. Iakisch, associate engineer in charge of drainage work, visited the Lower Yellowstone project for several days during March in connection with preparation of drainage specifications.

R. R. Parrett, representing the Bureau of Indian Affairs, conferred with district officials on the Newlands project in regard to furnishing water to the Paiute Indian Reservation lands.

On March 16 the Colorado section of the American Society of Civil Engineers gave a dinner at the University Club in Denver, at which a number of the project superintendents and others were in attendance. Doctor Mead was the principal speaker.

W. W. Johnston, associate reclamation economist, arrived on the Yakima project on March 5 and spent a few days in going over the land of the proposed Yakima extensions.

A project office has been installed in the Nelsen Building in Vale, Oreg., Vale project. Chief Clerk Voyer is expected to report from Hermiston at an early date.

### *Pan Pacific Conference Honolulu, Hawaii, April 11-16*

**I**N attendance upon the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held at Honolulu, Hawaii, April 11-16, were the following representatives of the Department of the Interior:

Dr. Hubert Work, Secretary of the Interior.  
Dr. John J. Tigert, Commissioner of Education.  
Dr. Elwood Mead, Commissioner of Reclamation.  
Hon. Stephen T. Mather, Director of National Parks.  
William J. Donald, secretary to Doctor Work.  
Theophilus Honour, secretary to Doctor Tigert.  
H. A. Brown, chief of the division of settlement and economic operations, Bureau of Reclamation.  
J. F. Abel, assistant specialist in foreign education systems, Bureau of Education.

The next issue of the ERA will contain a report of the conference, the only word having been received as the ERA goes to press being a radiogram from Mr. Donald telling of the safe arrival, in excellent physical condition, of the party in Honolulu.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

George C. Kreutzer, Director of Reclamation Economics

P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. A. Bissell, Chief of Engineering Division

C. N. McEnlooh, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	W. C. Berger.....	B. E. Stoutemyer.....	El Paso, Tex.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	Montrose, Colo.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Billings, Mont.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	M. M. Wilson.....	E. E. Roddis.....	Berkeley, Calif.
King Hill <sup>2</sup> .....	King Hill, Idaho.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Billings, Mont.
Klamath.....	Klamath Falls, Oreg.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Do.
Lower Yellowstone.....	Malta, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	B. E. Stoutemyer.....	Portland, Oreg.
Milk River.....	Burley, Idaho.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	Miss E. M. Simmonds.....	Mitchell, Nebr.
Minidoka <sup>3</sup> .....	Fallon, Nev.....	A. W. Walker.....	L. H. Mong.....	W. D. Funk.....	N. D. Thorp.....	Berkeley, Calif.
Newlands <sup>4</sup> .....	Mitchell, Nebr.....	H. C. Stetson.....	W. D. Funk.....	C. H. Lillingston.....	C. H. Lillingston.....	Berkeley, Calif.
North Platte <sup>5</sup> .....	Okanogan, Wash.....	Calvin Casteel.....	R. B. Smith.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Okanogan.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	R. B. Smith.....	Wm. J. Burke.....	Mitchell, Nebr.
Orland.....	Owyhee, Oreg.....	F. A. Banks.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	R. B. Smith.....	R. B. Smith.....	Wm. J. Burke.....	Mitchell, Nebr.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Salt River <sup>6</sup> .....	Phoenix, Ariz.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Shoshone <sup>7</sup> .....	Powell, Wyo.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Strawberry Valley <sup>8</sup> .....	Provo, Utah.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Umatilla <sup>9</sup> .....	Hermiston, Oreg.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Uncompahgre.....	Montrose, Colo.....	H. W. Bashore.....	C. M. Vopen.....	J. C. Gawler.....	B. E. Stoutemyer.....	Portland, Oreg.
Vale.....	Vale, Oreg.....	J. L. Lytel.....	R. K. Cunningham.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.
Yakima.....	Yakima, Wash.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>10</sup> .....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>10</sup> .....	Chas. Klingman.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>11</sup> .....	E. R. Mills.....	F. C. Lewis.....	B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gihson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>11</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Damsite, Elk Creek, Calif.....	H. J. Gault <sup>11</sup> .....	C. B. Funk.....		R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuua, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

<sup>10</sup> Resident engineer.

<sup>11</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise.....	Boise, Idaho.....	R. J. Newell.....	
Middle Rio Grande.....	Albuquerque, N. Mex.....	C. C. Elder.....	Middle Rio Grande conservancy district.
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	State of Utah.
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	State of Wyoming.
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



A PROFITABLE CROP ON THE BELLE FOURCHE PROJECT



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# NEW RECLAMATION ERA

VOL. 18

JUNE, 1927

NO. 6



IRRIGATION ON A RECLAMATION PROJECT



**R**esolved, That the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, in Plenary Session assembled, upon recommendation of the Reclamation Section, affirms:

1. Its strong conviction that control of all water in rivers, streams, springs, lakes, marshes, and natural receptacles and water sources should vest in the Government.    ❧    ❧
2. The necessity of recognizing that the fundamental requirements of land settlement should be those that will assure the efficient and bona fide settler security of tenure, including extended terms of payment for the land, sympathetic assistance by means of advances of money for the preparation and establishment of the farm in its early stages, the providing, as far as practical, of social conveniences and means for recreation, and the encouragement in every way of individual effort and initiative

❧

*Resolutions concerning reclamation adopted by the Pan Pacific  
Conference on Education, Rehabilitation, Reclamation,  
and Recreation, held in Honolulu, Hawaii,  
April 11-16, 1927*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

JUNE, 1927

No. 6

## *Interesting High Lights on the Reclamation Projects*

**A** RECENT issue of Yakima Valley Progress voices its faith in the valley as follows: With a construction program for the entire Yakima Valley amounting to \$7,506,599 under way, with deposits in the city's four banks higher than last February, with irrigation conditions the best in years, due to 7.99 inches of precipitation since September 1, and with apples fully 75 cents a box higher than a few weeks ago, there can not help but be a healthy business condition this spring.

**D**URING the month 90 acres of trees were set out on the Yuma Mesa. This year's planting is expected to reach 200 acres.

**O**N the Grand Valley project practically all crops except beans, corn, and oats had been planted by the end of April. Prospects for the season continued favorable and soil conditions were particularly satisfactory. Both early potatoes and beets were showing through the ground and most of the alfalfa hay was making a splendid growth.

**T**HE Chamber of Commerce of Montrose, Uncompahgre project, in co-operation with the Montrose Bar Association, has been giving consideration to the working out of a plan whereby several thousand acres of land east and southeast of Montrose will be drained and protected from future seepage. It is contemplated that this drainage work will be accomplished by open ditch.

**T**HE Boise project reports exceptionally cold weather during the month of April. Four frosts listed as "killing" occurred during the month. Some damage was suffered by peaches and apricots. The sweet-cherry crop was being largely protected by smudge pots. The growth of crops has been less than normal. Spring grain, however, was in excellent condition.

**G**ROUND has been purchased and is being prepared for the erection of a milk condensary at Burley. The organization promoting this undertaking is known as the Idaho Star Evaporated Milk Co.

**S**TATEMENTS issued this spring from the two banks at Burley, Idaho, announce total deposits of nearly \$13,000,000, an increase of about \$200,000 over last year's total.

**O**N April 18 field headquarters for the Gooding project were established at Eden, a town of about 400 people on the first segregation of the North Side Twin Falls project. Commodious office and storage space was secured and the preparatory work of getting quarters arranged was immediately started.

**P**ROBABLY the most important event during the month was the completion by the Utah Construction Co. of its contract and the formal delivery of the American Falls dam to the United States on April 20. For this occasion a number of those who had taken part in the work of building the dam assembled at American Falls, an informal celebration was arranged, motion pictures were taken, and the event was given wide publicity over the State and the country.

**O**N the North Platte project one of the worst snowstorms of record occurred from April 10 to 14. It was estimated that more than 2 feet of snow fell and the high wind drifted the snow into many deep drifts. All roads were impassable for several days and with the exception of the highway, were poor all month.

**A** FEELING of optimism prevails on the Newlands project, and the farmers are looking forward to a prosperous year.

**T**OTAL shipments from the Yakima Valley to the end of April amounted to 12,053 cars of apples and 7,826 cars of potatoes. Shipments for 1927 have made a good beginning with 10 cars of asparagus during the month.

**O**NE additional application was received for a farm unit on the Riverton project during the month of April.

**A**DVANCE reports from the Great Western Sugar Co. show intentions to plant 4,200 acres of beets on the Garland division of the Shoshone project this year, which is a 38 per cent increase over 1926. A similar increase is expected on the Frannie division. This crop looks unusually remunerative, as the company has practically guaranteed \$8.50 per ton. Other row crops are also expected to show an increase this year except seed peas. The seed pea company operating on the Garland division is not contracting peas except varieties which are planted in rows, owing to overproduction in the canning industry.

**D**URING the month of April the Powell Creamery, on the Shoshone project, purchased 7,700 pounds of butterfat and manufactured 9,700 pounds of butter and 300 gallons of ice cream. Other agencies purchased 5,000 pounds of butterfat. Ninety-six hundred pounds of cream were shipped from the Frannie division, of which 5,600 pounds went to the Powell Creamery.

**P**UBLIC notice has been issued by the Secretary of the Interior announcing an opening to entry on June 1, 1927, of 54 public-land farm units in part 1 of the Willwood division of the Shoshone irrigation project, Wyoming. Information concerning this opening may be obtained from the Commissioner, Bureau of Reclamation, Washington, D. C., or the Project Superintendent, Powell, Wyo.

# Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation

Honolulu, Hawaii, April 11-16, 1927

**T**HE Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held in Honolulu, Hawaii, April 11 to 16, 1927, presented an unusual opportunity for an interchange of ideas by the countries bordering on the Pacific. Especial interest was shown by the countries participating in the activities of the reclamation section which dealt with the reclamation methods and policies of these countries and their contributions to our knowledge of special features of reclamation.

The program of the reclamation section comprised morning sessions devoted to the presentation of prepared papers and afternoon sessions for round table discussion. The following papers were presented:

Elwood Mead, Commissioner, Bureau of Reclamation: "The policies and problems of Federal reclamation."

William Cattanaeh, chairman, State Rivers and Water Supply Commission, Victoria, Australia: "Conservation and use of water."

Nils Olsen, Assistant Chief, Bureau of Agricultural Economics, Department of Agriculture: "Land-settlement policies and their relation to the development of a prosperous agriculture in the United States."

José Mares, National Commission of Irrigation, Mexico: "Irrigation projects and some problems connected with reclamation."

Frederick Krauss, University of Hawaii: "Difficulties of settlers. Aid and direction which should be given."

E. J. T. Manchester, president Water Supply Board, Brisbane, Queensland, Australia: "Proposals for the settlement of reclamation projects."

K. Kachi, expert Ministry of Agriculture and Forestry, Japan: "Land improvement and reclamation in Japan."

C. C. Teague, president California Fruit Exchange: "Cooperative organizations for the marketing of products from irrigated areas."

A. C. Hardison, director American Farm Bureau Federation: "The financing and operation of a cooperative rural community."

E. Torres Belon, Lima, Peru: "Policy of Peru in irrigation, autocolonization, and colonization of the country in the last six years."

Thomas H. Hunt, professor of agriculture University of California: "The achievements of a private land settlement colony. A report of progress."

Rev. Akaiko Akana, member Hawaiian Homes Commission: "The experience of Hawaiian Homes Commission in carrying out its work."

Gershon Agronsky, representative, Zionist Organization: "The agricultural settlement of Palestine."

Marshall Dana, editor, Journal, Portland, Oreg.: "Problems of State and district reclamation."

In addition to the prepared papers, other topics for discussion at the round table were as follows:

1. The appropriate fields of public and private development in reclamation.

2. Conditions under which Government should undertake reclamation of privately owned lands, and methods which should be followed.

3. Factors which affect the value of water in irrigation and the maximum yearly outlay for water which irrigators can afford to make.

4. Where Government constructs irrigation works, which is to be preferred—Building the works by day labor or building by contract?

5. Devices for the measurement of water.

6. Losses of water from canals in distribution.

7. The settlement of land:

(a) Qualifications of settlers in the way of capital and experience.

(b) Time of payment for land and water.

(c) Advice and direction to be given.

(d) Extent of financial advances which are feasible and the methods by which they should be supervised.

It was gratifying to note that the attendance at the meetings of the Reclamation Section was not only sustained throughout the period of the conference, but increased from day to day, more than 50 persons being present on the last day.

The papers and discussions are being prepared for publication in the full report of the conference, which it is hoped can be made available for distribution within the next few months.

One of the interesting features of the conference was the visit to the island of Molokai by Secretary Work and Commissioner Mead to inspect the homestead settlements under the Hawaiian Homes Commission. Here 116 homesteaders are developing 40-acre farms and furnishing a striking example of what may be accomplished in bringing the Hawaiians

back to the land. Near Hilo, also, on the island of Hawaii, 80 families, formerly tenement dwellers in Hilo, are living on 1-acre house lots, developing a community spirit and giving every promise of success.

On the return to San Francisco of the Secretary of the Interior, he made the following statement concerning the results of the conference so far as it related to the work of the Reclamation Section:

One of the important gains of the Reclamation Section of the conference was the personal contact of men holding responsible positions in the administration of irrigation laws in nearly all of the countries bordering the Pacific. These men know what their respective countries are endeavoring to do. They know the strength and weakness of their methods and the obstacles which have to be overcome in the conquest of aridity. I speak of irrigation because this is the form of reclamation made prominent at the conference.

The first two days were devoted to a discussion of the aims and methods of the different countries. Part of this discussion was the presentation of formal papers by administrative authorities, but the more valuable feature was the informal round table discussion which followed. There was general agreement that the engineering methods of reclamation by irrigation are now as well standardized as those of railroad building. Little attention was given to this, although there was surprise expressed at the engineering achievements in Federal reclamation in the United States which were presented in statistical tables, diagrams, and photographs that will be incorporated in the report of the conference.

The complex question of what authority should control the distribution of streams and the nature of the rights to be recognized therein had serious attention. It became apparent that the United States can learn much from what other countries are doing. The contrast between the continuous and costly litigation in California, which has recognized the doctrine of riparian rights, and the entire absence of water-right litigation in Australia, where this doctrine has been definitely abrogated and where there is State control of public water supplies and State administration of streams placed on a definite and working basis, suggests the need of further action on this matter in the United States. It is further shown by

the necessity for administrative control of streams throughout their length, where they pass through several States, as does the Colorado. A resolution of the conference—

"Affirms its strong conviction that control of all water in rivers, streams, springs, lakes, marshes, and natural receptacles and water sources should vest in the Government."

This was adopted unanimously, both in the Reclamation Section and by the conference as a whole. It discards the doctrine of riparian rights in favor of public control by the Government, State or National, of all water supplies.

All of the countries represented at the conference are finding it necessary to help settlers change raw lands into farms, and other countries are doing more in this direction than the United States. They give greater assistance in the preparation of the land for irrigation, in providing advances to help settlers equip their farms, and in giving advice and direction as to methods of cultivation, crops to be grown, and cooperation in producing and marketing. This matter is of such importance in the United States as to justify the wide publication of this resolution adopted regarding this feature:

"Resolved, That the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, in plenary session assembled, upon recommendation of the Reclamation Section, affirms the necessity of recognizing that the fundamental requirements of land settlement should be those that will assure the efficient and bona fide settler security of tenure, including extended terms of payment for the land, sympathetic assistance by means of advances of money for the preparation and establishment of the farm in its early stages, the providing, as far as practicable, of social conveniences and means for recreation, and the encouragement in every way of individual effort and initiative."

The papers and discussions at this conference of the different phases of reclamation by irrigation should be read and studied by the people of the western third of the United States. They show that while there is considerable variation in present economic methods, there is a remarkable agreement among those who hold responsible positions as to principles and policies which should be adopted.

The members of the Reclamation Section believe there should be a second conference at an early date. This one served to clear the ground for a more thorough study of certain legal and economic features of reclamation. The next one would have the benefit of the personal contacts formed at this one, of a better

## New Water Law of Honduras

A new water law was passed by the National Congress of Honduras on April 9, 1927, to become effective on August 1, 1927, the beginning of the next Honduran fiscal year. The measure, as reported by Richard Ford, American consul at Tegucigalpa, Honduras, represents a considerable amount of research work on the subject by the permanent commission of the Republic, and is of particular interest as indicating the present trend of Honduras in the matter of placing its natural resources on a more or less government-controlled and economic basis. The following is quoted from chapter 1, on the "Ownership of waters":

"ARTICLE 1. To the State belongs the full ownership, inalienable and imprescriptible, of—

"1. The waters of the territorial seas which bathe its coasts and islands, in that width determined by international law, with its beaches and its coves, bays, harbors, ports, and other shelters which may be used for fishing and navigation.

"2. The waters of lakes, lagoons, estuaries, rivers and streams of constantly running waters, with the exception of article 3.

"ART. 2. To the State also belongs the ownership of fluvial waters which course over national lands, and of subterranean waters existing under the same.

"ART. 3. The following constitute private property:

"1. The ownership of the waters of currents which are born and die within one piece of property.

"2. That of fluvial waters while coursing over a private tract.

"3. That of subterranean water under a tract, reduced to possession by the owner of the same."

In general, as stated by Mr. Ford, the new water law may be summarized as a piece of legislation whose first object is the increasing of the country's revenue, and, secondly, the bringing of control of all national waters more into the hands

knowledge of what the different countries are seeking to do, so that the discussions of the conference could be centered in advance on vital issues. The information brought by the different countries on legal, economic, and social questions could be more complete and hence much more valuable to all those interested in the creation of a high type of rural civilization in the widely scattered and important countries which would participate.

of the government; and although not fully acceptable, in its present form to the majority of "company" interests, it is nevertheless considered by them to be of outstanding importance in the future commercial and economic development of the Republic.

## Irrigation in the Punjab, India<sup>1</sup>

AT the opening meeting of the Punjab Engineering Congress on February 24, 1927, the president stated that in the irrigation department the event of the year was the opening of the Suleimanki headworks. This was the beginning of irrigation from the Sutlej Valley project, the largest irrigation enterprise in the world. This scheme will develop an irrigated tract equal to the whole of Egypt.

In 1901 the canals in the Punjab commanded 11,800,000 acres and annually irrigated 5,700,000 acres; these same canals now, with the same amount of water, will irrigate an area of 40 or 50 per cent more than they did at that time, due to increased efficiency in the handling of the water by the irrigation branch backed up by the intelligent development of the Punjab agriculturist.

The new canals which have come into operation since 1901 command 5,200,000 acres of land annually and irrigate 2,800,000 acres. The Sutlej Valley project has only just begun irrigation, but when in full operation the total area commanded from the Punjab rivers will be 27,500,000 acres, an increase of about 9,000,000 acres of irrigation over the 1901 figures. In addition, there are four projects awaiting sanction which, while improving irrigation in existing irrigated tracts, will command 7,700,000 acres more land and produce a further increase of 5,000,000 acres of irrigation annually. Then these projects are completed the Punjab river canals will command 35,000,000 acres and irrigate 19,000,000 acres annually at a capital outlay of under 50 rupees (\$18) per acre irrigated annually, or less than the value of the crops raised.

A SURVEY of the farms on the Belle Fourche project shows that about 75 new families have settled on the project since the last crop season.

<sup>1</sup> From the Civil and Military Gazette, Feb. 27, 1927.

## Stony Gorge Dam Dedicated With Appropriate Ceremonies

*From the Orland Register, May 6, 1927*

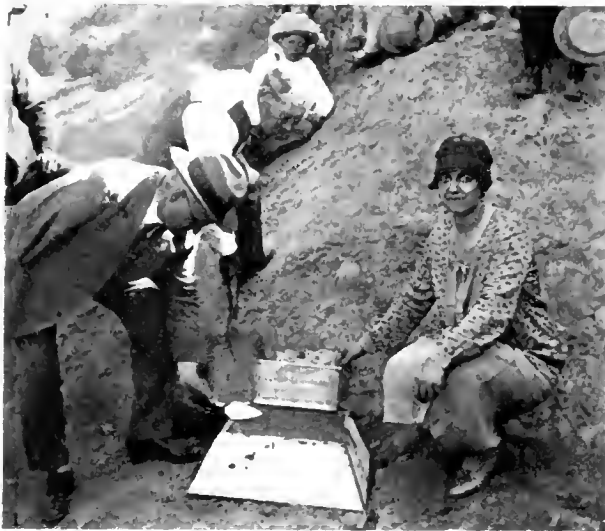
WITH every spot of vantage on the steep hillside covered with interested spectators, the first concrete for the \$1,000,000 Stony Gorge Dam was poured last Tuesday afternoon. The ceremonies attending the pouring of the first yard of concrete mark the culmination of four years of active endeavor to secure for the Orland project a water supply which will be adequate for all time for the demands of the 20,000 irrigated acres within the Federal project at Orland. The dam, which has been under construction for the past six months, will be completed in

the fall of 1928, so that the reservoir lake formed by the huge pile of concrete and steel will store 50,000 acre-feet of water for the irrigation season of 1929. This, with the storage at the completed East Park Reservoir, will give Orland a total of over 100,000 acre-feet of storage water.

Between 1,200 and 1,500 visitors from the Land of Orland and the towns of the Sacramento Valley viewed the ceremonies at Stony Gorge, which were arranged and entirely under the supervision of the Orland Chamber of Commerce. Special representatives were present from

Sacramento and San Francisco, Chico and Oroville, Corning and Williams, while Willows sent an exceptionally large delegation to the event which means so much to the sister city.

Perfect weather and perfect arrangements made the day one of unqualified success. The caravan which left Orland promptly at 9.30, contained over 75 machines, and twice as many made the trip earlier in the day or, followed the caravan. At Willows, a score of county-seat machines joined the caravan for the trip to Elk Creek where picnic lunch was enjoyed at the school grounds.



DEDICATION OF STONY GORGE DAM, ORLAND PROJECT, CALIFORNIA

1. Dr. Mead and Miss Schnurr placing tablet.
2. Listening to the addresses.
3. From left to right: H. J. Gault, construction engineer; George Sturm, president, water users' association; R. C. E. Weber, project superintendent; William Cattenach, chairman, State Rivers and Water Supply Commission of Australia; R. C. Coffey, district counsel; Dr. Elwood Mead, Commissioner of Reclamation.
4. The tablet in place.



At 1 o'clock the crowd journeyed on to the dam site to view the work now under way on the \$1,000,000 structure. Most of the work completed has been excavation for the necessary rock foundations and the completion of the modern construction camp by the Amberson Dam Co., who are the contractors for the big job.

At 2 o'clock the Orland municipal band gave a number of selections, following which the preliminary exercises were held in the flat to the northwest of the dam site. R. C. E. Weber, project manager and president of the chamber of commerce, was the chairman of the day. George Sturm, president of the water users and mayor of Orland, spoke briefly on the four years' fight to secure the necessary appropriation on favorable terms to make possible the construction of the dam. Mr. Sturm reviewed the need of the work, the enlisting of the support of men in Washington, and the long up-hill fight which finally led to victory. He completed his talk with a strong plea for closer co-operation for the public good by all men and women interested in the land of Orland.

John D. Coffman, district forester of the California National Forest, gave a short address, pleading for preservation of the forest from which Orland receives its supply of water for irrigation. A number of others were introduced and congratulated Orland on the cooperative spirit which had made possible the construction of the additional dam and reservoir.

Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, the guest of honor of the day, spoke but a few minutes, and pointed out the advantage of small acreages intensively cultivated which were made possible by such construction work as the Stony Gorge Dam. Doctor Mead, who is the foremost authority on irrigation in the United States and the father of the Durham colony plan, which in a modified form will be established in the Orland project under his personal direction, made no glowing promises for the future, preferring to bring about the prosperity of the coming decade by deeds rather than words.

Following the exercises, the ceremonies of pouring the first concrete at the dam site took place. George Sturm and R. C. E. Weber had the honor of mixing the concrete, and Doctor Mead aided in the pouring. To Miss Mae A. Schnurr, secretary to Doctor Mead and associate editor of the Reclamation Era, went the honor of placing the bronze plaque in the concrete, commemorating the event.

This plaque contained the following inscription: "Orland Chamber of Commerce, May 3, 1927. Non Nobis Solum."

(Not for self alone.) This slab of concrete with the plaque embedded in it will be placed on the solid masonry at the top of the completed dam.

The entire program went off without a marring note and resulted in columns of publicity in the valley newspapers and the metropolitan newspapers of San Francisco, Sacramento, and Los Angeles calling attention to the fact the Land of Orland will have a water supply by the spring of

## Bureau Annual Report Not to be Printed

*Under authority of the act of February 23, 1927, the Secretary of the Interior has issued an order discontinuing the printing of separate annual reports by the Bureau of Reclamation, General Land Office, Bureau of Pensions, Bureau of Education, Geological Survey, and National Park Service. Manuscript copies of these reports will, however, be prepared as usual and will be on file in the Secretary's office for public inspection.*

*The purpose is to issue a consolidated report for the Secretary of the Interior, giving a readable, running account of the work of the department by bureaus and subjects without the mass of detail that has heretofore characterized the annual reports. The textual matter will be a generalization of the work of the bureaus and the principal statistics will be given in tabular form in the appendix.*

1929 which will be adequate for all demands in the years to come. The event was the biggest single piece of publicity ever attempted by a chamber of commerce of a valley town and the dedication exercises were of an order never before attempted by a community in the Sacramento Valley.

Distinguished guests present at the dedication exercises included the following:

Dr. Elwood Mead, Commissioner Bureau of Reclamation, Washington, D. C.  
William Cattenach, chairman State Rivers and Water Supply Commission of Victoria, Melbourne, Australia.

Miss Mae A. Schnurr, secretary to Commissioner Mead and associate editor NEW RECLAMATION ERA, Washington, D. C.

Richard J. Coffey, district counsel, Bureau of Reclamation, Berkeley, Calif.

Garnett King, assistant passenger traffic manager, Southern Pacific Line, San Francisco, Calif.

J. R. Mason, president J. R. Mason & Co., irrigation securities, San Francisco, Calif.

John D. Coffman, district forester, United States California National Forest, Willows, Calif.

R. L. Kimmel, manager agricultural and mining department, Sacramento Chamber of Commerce, Sacramento, Calif.

Irwin Engler, advertising and publicity, formerly secretary, Sacramento Chamber of Commerce, Sacramento, Calif.

Van Bernard, assemblyman, fifth district.



Irrigating an orange grove

## Average Gross Incomes Determined by Crop Census<sup>1</sup>

By Geo. O. Sanford, Superintendent, Sun River Project

THE following question was once given in a school examination, "Who discovered the Pacific Ocean?" and one boy, with more imagination than an intimate knowledge of history gave this answer, "The natives along the shore." It will have to be conceded that this answer is correct and yet there is something lacking. The natives along the shore most certainly did discover the Pacific Ocean, but they neglected to tell the world about their discovery and as a result some one else got the credit. From this little story we reach the conclusion that it pays to advertise and when one does something worth while, the next step is to let the world know. This is one of the reasons why we have a crop census on reclamation projects. Of all the statistical records kept there can be no question that the crop report is the most important and has been of the greatest assistance in giving a conclusive answer as to the benefits of reclamation and why the policy should be continued. With the passage of the act of December 5, 1924, the compilation of the annual crop census is a matter of still greater importance for the reason that on many projects this report serves as a basis for determining the annual construction installment to be paid by the water users.

### COMPETENT ENUMERATORS ESSENTIAL

On projects operated by the Reclamation Bureau the responsibility of securing and compiling the annual crop census rests upon the project superintendent, and it is

his duty to select competent men to get the information from the farmers. Experience has shown that the most effective means of accomplishing this result is through personal interviews with the landowners or water users who produced the crop. The best and most economical method of taking the crop census seems to be to select a trustworthy employee of the Reclamation Bureau, either a water master or ditch rider, and have him make a complete canvass of all farms in a given district, laying out a prescribed route so as to avoid unnecessary travel. It sometimes happens that it is possible to interview a number of farmers at some public sale or gathering in the fall of the year and secure from them the information desired, and by such methods considerable time and expense may be saved in picking up the loose ends of the crop census.

The census card should be carried in the field and information filled out in the presence of the farmer and if possible his signature secured, showing that the data have been prepared with his knowledge. If the farmer does not sign the card, it should be signed by the enumerator. It is also advisable to encourage the farmer to keep a similar record for his own information, and where desired it is well worth while to furnish him with a Government card in order that he may have a record of his annual farming operations. Occasionally the census taker meets with a refusal to furnish the desired information, and though there are cases where it may not be possible to secure the information from the man himself it is usually possible to secure most of the crop data from men

who have worked on the farm as in the case of threshing crews, or from grain elevators, sugar companies, or shipping associations. Ditch riders generally have an intimate knowledge of farming operations and can also make very close estimates as to what crops have been produced.

### DETERMINATION OF UNIT PRICES

The unit prices to be used in determining the value of crops must be obtained from various sources. In the case of small grains it is possible to secure accurate information from the local elevators, as they are usually willing to show their records covering the amount of grain purchased and the prices paid. Alfalfa is not so easily priced because on many projects only a small portion of it is sold and in all cases very little of it has been disposed of at the time the crop census is compiled. On projects where there are alfalfa mills the price delivered loose at the mill can be used to determine the value of hay in the stack. By the last of December it is usually possible to get a fair idea of the value of alfalfa, but if it should transpire that there is a marked increase or decrease in price of the unsold portion of the crop it may then be necessary to revise the annual crop report. This condition prevailed on several of the Montana projects in 1920, and before all crops were sold on Sun River project there was an average decrease of \$10 per acre in the average acre income for that year. It is always desirable to confer with the commissioners of the irrigation



Strawberry patch on the Yakima project, Washington.

<sup>1</sup> Address delivered before Reclamation Conference in Denver, March 16-18, 1927.

district for the purpose of getting their ideas as to unit prices and wherever possible an agreement should be reached, but the final determination must rest with the officials of the Reclamation Bureau.

The value of pasture on projects is a question on which there is not only a considerable difference of opinion but a wide range in the value of pastures depending upon whether they are native grass or a well prepared mixed grass pasture. At the time the crop census is taken the area and value of each pasture should be secured from the owner and from these figures the average value figured for the entire project, and in this connection it may be well to mention that a mixed grass irrigated pasture is frequently one of the most valuable portions of the farm.

#### PRELIMINARY CENSUS OF VALUE

It has been found to be of considerable value on some projects to take a preliminary crop census sometime in June for the purpose of determining about how much land is in cultivation and being irrigated. At that season of the year there is usually not a very strong demand for water on northern division projects and there is ample time to get the information without additional expense. It has been found that information relative to cropped areas is more readily furnished at that season of the year than in the fall after crops are harvested, and it is quite interesting to make a comparison between the areas covered by the June report and the final crop census. It quite frequently happens there has been a reduction in the area reported to be in crop.

#### CHECKING THE RETURNS

Another matter of considerable importance in this connection is a rather

intimate knowledge of what each farmer has been doing during the irrigation season so that if there is an apparent erroneous report as to the yield on any particular field it can be detected. It is admitted that any water user may be able to make slight reductions in reporting crop yields, but to get by with any radical change is a matter that is very apt to be discovered, and furthermore, the man who is willing to submit returns with a small percentage of error stands a pretty good show of eventually being found out and the resulting slight financial gain to him is far out of proportion to the unenviable reputation he thus brings upon himself. Although it is well to have confidence in the integrity of the farmers on the project, there can certainly be no harm in using ordinary methods in checking up crop reports which can be done with the operators of threshing machines, elevator men, mill operators, and others. Where there seems to be some cause for believing the returns are not correct, such cases should be given further detailed consideration. On all of the projects alfalfa is one of the most important crops, and it will have to be admitted that the methods used to determine the quantity of hay produced are usually rather crude. Often it is only an estimate of so many tons per acre. It would be quite a task to measure every stack of hay on a project, but it might be advisable to measure the alfalfa on a few farms for the purpose of determining the probable percentage of error and applying this to the reported returns of the entire crop. One case on Sun River project showed 20 acres of alfalfa yielding 2 tons per acre. The hay was measured in the stack and computed to be 46.6 tons, or an error of 16.5 per cent. If this percentage were applied to the entire crop it makes an increase in the average value per acre for the season of

1926 of 46 cents, or an increase in the annual construction charge of 2 cents. This sounds like a very small amount but it means an increase of \$800 in the annual installment on a project of 40,000 acres.

The crop census cards have been of great value to the Reclamation Bureau in determining whether there is reasonable ground for granting relief in some particular case, and the figures showing the total value of crops produced each year have proved the best evidence that can be used.

#### A RECORD OF ACCOMPLISHMENT

As has been the case in the past, the chief future value of the crop reports on reclamation projects is the definite showing of what has actually been accomplished in the way of the production of new wealth. When the returns of all of the projects have been compiled the results are really startling and there can be no question that these crop reports have had more influence in securing congressional appropriations for continuing construction work than any other argument that could be presented. Furthermore they are accurate and reliable, more so perhaps, than any other crop reports prepared under the supervision of the Government, and yet when we consider all the figures it is quite natural to ask why the average showing is not any better. It does not require much energy or ambition to reach only the average class. We must look to the farms that stand at the top of the list, find out what crops they have produced and the methods that have been followed, and then make an effort to have equally good crops produced on every farm. And here again the crop census gives us some very valuable data on which to base a program for bringing about a marked increase in the prosperity of our reclamation project farms.



Tornillo Canal and sluice gates, Rio Grande project, New Mexico-Texas

## Poultry Production a Growing Industry in Western Colorado

*Western Colorado Poultry Show to be held at Delta in January, 1928*

*By G. W. Dyer, Horticulturist and Pest Inspector, Cedaredge, Colo.*

**N**OW that a satisfactory settlement has been perfected whereby the more serious burdens of the Uncompahgre project have been at least partially removed, settlers have a right to hope for a period of prosperity. I hope that it will not be considered out of place for a believer in the lowly hen to suggest that poultry is one of the very sure helps to success. The hen and the cow have pulled many a section out of a plight much worse than the Uncompahgre has faced. Here we have the advantages of the best climate and soil, with ample water now assured and with the help of poultry, we will be able to begin anew to build up a section greater than many others that have heretofore succeeded.

We have among us one of the most capable poultrymen obtainable, H. A. Ireland, county agent, Montrose County, who has been our valued secretary since the beginning of our association, an advantage not possessed by every community, and no one man is more responsible for the growth and development of the poultry industry than he.

I do not favor a headlong rush into the game without due and careful consideration; quite the contrary. I would advise those who are not entirely familiar with the production of poultry to begin in a very modest way, then gradually build up vigorous and productive flocks.

Purebred flocks are always preferable to mixed breeds from any standpoint. Eggs from mixed flocks never have and never will bring profitable or satisfactory prices, mainly because they lack uniformity in shape and color which consumers of fancy eggs demand. They must also be absolutely clean. We people of Colorado have much to learn before we can hope to secure the top prices realized by other producing sections.

### PROFITABLE TURKEY SEASON

Just now we are enjoying a most prosperous experience with turkeys, the natural outgrowth of our organized effort to boost the poultry industry on the western slope. The market has been unusually favorable for a period of years, but naturally we must expect to encounter off years occasionally. Favorable conditions for growing this valuable bird are permanent with us; therefore there is no good reason why we will not

eventually become one of the greatest turkey-producing sections in the entire West.

Probably there is no better way to encourage this enterprise than to begin at once to prepare for our next big western Colorado poultry show in Delta next January. We are working for the biggest exhibit of turkeys ever shown in Colorado. Begin now to give your young stock every attention, so that they may become blue-ribbon winners. We are enlarging our classes and our premiums, and our show is now an established success. Those who have not heretofore exhibited should plan to do so and bring their best. Hundreds of splendid sales are made each year at the show because fanciers are learning that it is far better to make their selections from our exhibits, where they can see what they are buying, than to send to unknown breeders and pay perhaps double the amount charged for better stock here. Western Colorado has as fine poultry as any section, and the money, amounting to perhaps thousands of dollars which is sent out of the country each season for stock, eggs, and baby chicks, could be used to better advantage at home.

In the early days of our first regular shows those of us who took the trouble to exhibit our birds did so because we were partial to some fancy breed. It was largely a matter of pretty feathers. The fact that the breed we fancied was practical did not enter largely into the matter. We were regular old chicken cranks. Our entries were few in number and our attendance even less because there was little interest.

### EGGS OF MIXED FLOCKS BRING POOR RETURNS

Business men could not be persuaded that there was anything in poultry. They argued that eggs were an unprofitable commodity anyway. Mixed flocks of scrub hens naturally produced (if they produced at all) eggs of a conglomeration of shapes, sizes, and colors. These were gathered when convenient; if not, well, eggs were eggs anyway, regardless of age or condition, and all went to town in the same basket. Can we blame the merchant for not enthusing over the possible increase of such an undesirable commodity?

Our association began to realize that we had a real mission. We had to en-

courage more practical methods, more standard breeds that were capable of producing more eggs per hen, eggs that were uniform in shape and color, and something that would attract the eye of the consumer and compete with other sections. Mixed flocks must go. Conditions gradually improved, outside buyers came in, and clean uniform eggs became a cash product.

### DELTA, PERMANENT HOME OF WESTERN COLORADO POULTRY ASSOCIATION

In those days we arranged to hold our annual shows in Grand Junction, Montrose, or Delta. Our success was not flattering, though our admission fee was small, and our attendance was smaller. Delta first saw the light and responded in a more hopeful way than the other towns and gave us our first real encouragement. I well remember that our first outside help came from Dr. A. E. Miller, who was an interested visitor. He said: "Boys, you are doing something worth while; every business man in Delta should see this exhibit. Just give me 50 tickets and I will see that the business houses are represented." He sold the tickets with the distinct understanding that they must attend in person and boost for the success of the show, which they did, and we soon felt the influence of the wider interest and consequently outgrew our cramped quarters, a small room on a second floor. This gave us our inspiration to make Delta the permanent home of the Western Colorado Poultry Association, and we further decided to make it more educational by selecting the most thoroughly competent judges we could secure. The agricultural college sent their poultry expert to deliver a series of lectures each day of the show, and the effect was spontaneous. We made everything free; no admission fee, no membership dues. Again interest increased. Then our county commissioners visioned the possibilities of our efforts and came to our financial assistance, realizing that hundreds of farmers would be encouraged to add poultry as a source of additional income.

As a still further inducement we gave back all entry fees as premiums to the exhibitors and, contrary to precedent at that time, we established production classes, having discovered that there were many who hesitated to show their birds against what they termed experienced



breeders. Production classes gave them an opportunity of participating without coming in direct competition with standard-bred fowls, and this opportunity encouraged them to make their first exhibit. As a consequence to-day most of these same people are among our best and most successful exhibitors of standard breeds. They have learned that a standard-bred bird is capable of high egg production if bred along proper lines and having access to egg-producing foods.

#### BOOSTERS MAKE POULTRY INDUSTRY PROFITABLE

As a result the Delta County Chamber of Commerce took a very decided stand in our favor and every member saw the necessity of lending his influence. They talked poultry, attended our meeting, and became our most ardent advocates. Practically every professional and business man is a regular attendant at our shows, a booster, who takes a genuine pride in our success, not only from a financial standpoint but because he realizes that he has been largely instrumental in making poultry a profitable enterprise for western Colorado.

I recall that W. E. Gaylord, a noted breeder of Reds, marveled at our showing of over 600 chickens, 70 turkeys, and our overflow of visitors that taxed the capacity of the big Armory Building, and asked: "What is the secret of this wonderfully successful show?" On the following day in the Grand Junction Sentinel he stated: "Before the day was over I learned the secret. One of our number counted over 200 visitors in the building at one time; 150 attended Professor Ufford's lectures on the phases of poultry keeping. Six hundred specimens of choice poultry and 78 turkeys—three more than were at the National Stock Show. Why all this enthusiasm? Simply because their county commissioners, chamber of commerce, business men, lawyers, and doctors were there and had a full realization that the poultry industry is one of the big things that can help the farmer and keep his head above water during these trying times." Mr. Gaylord made no mistake and his surmise is correct. Delta, with her characteristic energy, approved of our show, and by so doing has assisted materially in building up a new and important industry on the western slope.

Edward T. Barber, agricultural editor of the Grand Junction Sentinel, says: "The poultry business in Delta County has assumed such proportions that it heads the list of profitable lines of industry. Shipments last year totaled 15 cars of chickens and eggs and 12 cars of turkeys, to the value of \$300,000. This enormous business was built up by the

united efforts of all other lines of business cooperating with the poultry men and encouraging them in every way. It pleases the merchant because the poultry men can either pay cash or meet their bills promptly at the end of the month; it pleases the banker because the poultry men are as good risks as the stockmen, the sheepmen, the hog men or the beet farmer; and it brings in three or four hundred thousand dollars that is pretty evenly distributed among all classes."

#### Project Water Supply

*Generally, an abundant irrigation supply is assured for the coming season. Weather conditions in April have served to retard the run-off and will insure good flows extending far into the irrigation season.*

*The Belle Fourche, American Falls, and Arrowrock Reservoirs are being operated in a way to provide a certain amount of flood control and mitigate flood damage.*

*On the Carlsbad project in New Mexico storage on hand is about sufficient to supply the irrigation demands for May. With the snow-fall in the watershed area below normal, future supply will be dependent on rainfall.*

*The Okanogan project is assured of a better supply than for some years past.*

The results are all the more startling when one considers that only three or four years ago the shipments were practically nil. I feel that we are just getting nicely started in this industry. There is practically no limit to what can be done in this line of enterprise, with thousands

of acres of cheap land that are especially adapted to turkey raising, and our generally dry seasons which are ideal for young poults. Apparently there is no limit to the demand for high-class turkeys that are produced here. The work is not laborious; they care practically for themselves after the first week or two, and on a good range the feed bill is negligible.

We do not hope to realize extreme prices each year for, like any other product, poultry will have its ups and downs; but with its constantly increasing use as food I do not anticipate in the immediate future that prices will be so low as to occasion a loss. Demonstrations by competent turkey raisers have proven that satisfactory profits have been realized at 21 cents.

I do not hesitate to prophesy that before many years the great Uncompahgre Valley will be devoted largely to the production of turkeys, chickens, and eggs, and that it will be compared with the Petaluma district, where over 51,000,000 dozen eggs were produced and 1,400 cars shipped at unbelievable prices to eastern markets last year. Add to this the vast amount that will be derived from our high-grade turkeys and consider what it will mean to Montrose, Olathe, and Delta. It truly is the "billion-dollar industry."

#### POULTRY EXHIBIT—DELTA ARMORY—JANUARY, 1928

Join with us in making our next show at the Delta Armory next January the biggest and best poultry exhibit in the West. More coops have been ordered, so there will be room for all. It will be a double-decker next time. Judge P. M. Pierce, of Denver, will again place the ribbons. This means that if your birds win a ribbon they are no longer just chickens; they are aristocrats, and their selling value is enhanced many times.



A few of Mrs. Howard Lathrop's flock of turkeys



## The Boise Project and the Hen

By J. H. Lowell, Caldwell, Idaho

**T**HE cattle and sheep men, the wheat and alfalfa farmers, the potato and fruit growers, the swine breeders, and dairymen, who developed and made productive the Boise project, could hardly have foreseen that so common an object as the farmyard hen could develop into an industry rivaling their own, and add greatly to the farmers' returns without diminishing the opportunities for other forms of agriculture.

Even the most enthusiastic poultrymen have been surprised at the rapid development which has been made possible not only by the highly favorable climatic conditions, the cheapness and ease with which suitable feeds can be raised, but also by the building of efficient marketing organizations insuring good prices for both poultry and eggs.

### EGG INDUSTRY INCREASES

Not many years ago Idaho imported eggs. By 1921 the egg industry had grown until in that year 13 cars of eggs were shipped out of the State. In 1926 there were 268 cars. About one-half of the shipments originated in Caldwell, the assembling point for the Boise project eggs.

### COOPERATIVE MARKETING OF EGGS

The first real attempt to stabilize the local egg market was by the formation of the Idaho Egg Producers' Association, a cooperative enterprise established in 1921. In 1924 the organization shipped for its members 69 carloads of eggs, valued at \$220,000. In 1926 the association marketed 101 carloads of eggs, making returns of \$360,000. This asso-



A modern poultry feeding plant at Caldwell, Boise project, Idaho

ciation handles eggs throughout southern Idaho, but about three-fourths of its business originates at the Caldwell station. Well-established concerns are also buying eggs, competition is keen, and there is a well-established cash market

### DRESSED POULTRY

The development of poultry feeding and the shipment of dressed poultry have been even more rapid. Three years ago the market for poultry in this section was almost nonexistent. There was, of course, some local demand and some shipments of live poultry were sent out of the State. During the past two years there has

sprung up a poultry feeding and shipping business to the extent that Caldwell firms during the year 1926 paid to poultry producers over \$850,000 and handled an aggregate of 2,500,000 pounds of poultry.

### TURKEY GROWERS UNITE

Included in the above is what is known as the "Turkey Pool." The turkey growers of southern Idaho are united into a cooperative organization and each year sell their product to the highest bidder for cash. Last fall one Caldwell firm purchased the entire pool, paying to the growers \$375,000, or around 40 cents a pound. Idaho turkeys have established their reputation in the big markets of the East.

### FEEDING DE LUXE

In order to prepare the poultry for market two strictly modern establishments have recently been erected in Caldwell. In these palatial homes the hen may end her days in luxurious feasting, cared for by trained attendants and served by dieticians and chefs. The result is all that any reasonable hen could ask for or that could be desired by any New York or Philadelphia epicure.

The plants now in operation have a capacity of 40,000 birds. The feeding period ranges from 5 to 10 days, so that about 6,000 fatted fowls may be put on the market each week.



Farm flock on the Boise project, showing type of chicken house in general use

### INCUBATORS AND CHICKS

The time of the modern hen is too valuable to spend in raising a family and the "settin' hen" would be as old-fashioned as a sunbonnet. But chicks must be hatched and raised. Two years ago there was not a commercial hatchery in this territory. There are now commercial hatcheries using mammoth incubators with an estimating annual capacity of 1,800,000 eggs. Besides this, there are numerous smaller hatcheries and farm incubators.

### POULTRY DEPARTMENT AT STATE UNIVERSITY

A rapidly expanding business such as the poultry industry, which requires skill and special knowledge in all its departments, must have expert guidance and advice to be successful. Fortunately this is supplied in Idaho through the extension department of the State University, and especially in the person of Pren Moore, specialist and director of the poultry department. Expert knowledge, practical skill, resourcefulness, tact, hard common sense, enthusiasm, the capacity for hard work, all make Mr. Moore invaluable in keeping the egg and poultry business on a safe, scientific, and profitable basis.

### EGG DAY

In the summer of 1923, 20 or 30 of the egg producers on the project, in cooperation with the Kiwanis Club of Caldwell, conceived the idea of driving around to some of the farms and inspecting the poultry houses and then eating a picnic lunch with their families at the park in Caldwell. This established the first "Egg Day."

The picnic was repeated each year, growing rapidly in numbers and interest, and there was added a program, egg exhibits, and prizes for the best egg records.

### DISTINGUISHED GUESTS

The governor of the State each year gave the address of welcome, and last year, in addition to the governor, Secretary of Commerce Hoover and Senator Borah were both on the program, Mr. Hoover giving the principal address. The program and the speeches were transmitted through amplifiers and broadcast.

### FIFTH ANNUAL EGG DAY

This year the fifth annual egg day, to be held the latter part of June, again assumes national importance from the fact that Louis J. Tabor, master of the National Grange, will be the principal speaker.

## German Credit for Colonization

GERMAN agricultural and social leaders have organized meetings recently to discuss the question of colonizing farmers from overcrowded districts in sparsely-populated sections of Germany and to explain the plans to the farmers. East Prussia and Pomerania in North Germany have been chosen as the most suitable places for colonization of farmers from southwest Germany.

According to the Federal colonization act of August 11, 1919, there has been set aside for the purpose of the act a total of 3,470,000 acres in East Prussia, Pomerania, Brandenburg, Silesia, Schleswig-Holstein, and Saxony.

In the promotion of colonization in these sections, the Reichstag appropriated a credit of \$59,500,000 on July 1, 1926, to extend over a period of five years. This is intended to provide for an annual colonization of from 6,000 to 8,000 colonists. In order to exploit the present favorable opportunity for colonization the sum of \$3,570,000 has been approved for immediate use.

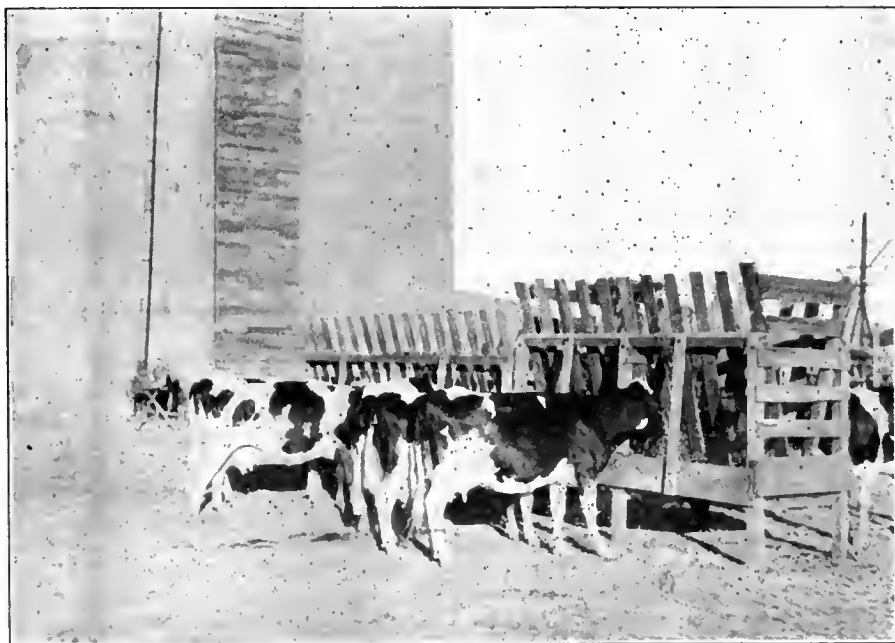
Enough land will be allotted to settlers to guarantee a livelihood. Where the soil is good, from 40 to 50 acres will be turned over to each settler, and where the soil is poorer, the size will vary between 70 and 80 acres.

Hitherto each settler has been required to have a cash capital of about \$1,200. As many prospective colonists are not in possession of the stipulated capital, both the Reich and the States have reduced the interest rates on the loans so that skilled farmers, although poor, may derive benefit from the land offered by the Government.

### ACTIVE SUPPORT EXTENDED TO SETTLERS

It has been estimated on the basis of past emigration that during the next decades from five to six villages, each comprising 40 to 50 farmers from southwest Germany, will grow up annually in northern Germany. The general scheme of the project includes the organization of a cooperative colonization association with its seat in Stuttgart, to be known as the South German Cooperative Association for Colonization in North Germany. The colonization company is to erect the dwellings and outhouses at an approximate cost of about \$2,500 for each place.

The colonization project has for its chief aim to render relief to the congested agricultural sections in Germany, but a predominant factor is also to reduce emigration as much as possible by giving indigent farmers an opportunity to make a living in their native land.



Registered cows on the Río Grande project, New Mexico-Texas

## Contracts with Irrigation Districts<sup>1</sup>

By B. E. Stoutemyer, District Counsel, Portland Oreg.

**D**URING the past two years contracts have been prepared, negotiated, approved by the department, voted by the electors, and executed by the districts and the Secretary of the Interior in connection with the following irrigation districts in the northwestern legal division:

Burley irrigation district, Minidoka irrigation district, King Hill irrigation district, Nampa-Meridian irrigation district, Boise-Kuna irrigation district, Wilder irrigation district, New York irrigation district, Black Canyon irrigation district, Big Bend irrigation district, Gem irrigation district, Owyhee irrigation district, Slide irrigation district, Payette-Oregon Slope irrigation district, Warm Springs irrigation district, Vale (Oreg.) irrigation district, Hermiston irrigation district, West extension irrigation district, and Kittitas reclamation district.

In addition to the contracts referred to above, which have been completed, contracts have been prepared and are now pending with the following:

Okanogan irrigation district (two contracts, one for construction of power plant and one for adjustment of charges), Black Canyon irrigation district (for construction of Payette division of the Boise project), and the American Falls Reservoir district No. 2 (for construction of Gooding project).

The contracts with the Kittitas reclamation district, and the Warm Springs, Vale, Oregon, Owyhee, Gem, Payette-Oregon Slope, and the Slide irrigation districts, and the contracts now pending with the American Falls Reservoir district No. 2 and the Black Canyon irrigation district are for new projects. The other contracts referred to above are with various districts on old projects.

In addition to the contracts referred to above, Warren Act contracts have been made with a large number of irrigation districts and some irrigation companies in connection with the American Falls Reservoir. These Warren Act contracts in connection with the American Falls Reservoir differ from the ordinary Warren Act contracts mainly on account of the fact that the parties cooperating with the Government in the construction of the American Falls Reservoir are paying in advance for their share of the reservoir. So far as I know, the advance-payment plan has been adopted only in the case of the American Falls Reservoir and the enlargement of the Jackson Lake Reservoir.

We find on each of the reclamation projects some conditions differing from those on any other project, and in each of the contracts above referred to there are a number of paragraphs which are peculiar to the district and project in

question and which deal with local conditions. But there are also a number of provisions which have become well established as standard provisions in such contracts and which are usually included in all cases.

Prior to the time that the recent contracts were made with the various irrigation districts in the State of Idaho, conditions were very unsatisfactory. Large sums were coming due each year as construction and operation and maintenance payments, but in most cases the payments were not being made and the delinquent charges had accumulated to astonishing proportions. On projects where the water users' association or other settlers' organization had no responsibility and nothing to do except agitate for relief from payment, agitators came into prominence and were elected on the boards of directors.

### IMPROVED CONDITIONS

Since the new contracts have been made each of the Idaho districts has met its agreed construction charges in full and is collecting its own operation and maintenance charges in advance, and where district elections have occurred the water users have elected directors who are constructive and conservative in their attitude. Under the adjustment contracts referred to above the construction payments accruing each year are not so large as they were under the old individual contracts, but the payments actually made are larger than under the former plan, and there has also been a vast improvement in the relationship between the water users and the Government on these projects; and a spirit of cordial co-operation now prevails where formerly there was suspicion and controversy.

This change is not altogether due to any one thing, but the fact that this marked change has occurred in so many different districts on several different projects indicates that the change is not altogether accidental but due, in part at least, to the change which has been made in the form of organization, the provisions of the contract between the water users and the Government, and the manner of operating the works.

On the Boise project, where a number of these districts are located, the year 1926 was a year of water shortage, with crops below the average, so that on that project at least the improvement in the relationship between the Government and the water users is not due to any

especially favorable natural conditions during the past year, but is in spite of an unfavorable water situation. One trouble with the former arrangement prevailing on the Boise project (and on many other reclamation projects) was that the Government was attempting to do business on an individual basis with each of the thousands of water users, both in the matter of operating and maintaining the ditches and laterals and in delivering water to individual water users, and also in the matter of collection of charges.

### OPERATION OF LARGE WORKS

The Federal Government is well adapted for the operation and maintenance of large reservoirs, especially in cases where one reservoir, or one system of reservoirs, serves a number of different projects. This is also true of large diversion dams or other structures which serve several different districts. In such cases there is usually more or less jealousy between the several districts, or several projects, which use the same reservoir or same system of reservoirs, and no district or project is willing to trust the operation of the reservoir on which it depends for its water supply to a rival district or project. The Government furnishes a convenient and disinterested organization for operating the reservoirs and large diversion works in such cases, and has had a large experience in the operation of such works. Congress seems to have had this distinction between the operation of the large reservoirs and the operation of the ditches and canals in mind even at the time when the original reclamation act was passed, for it was provided in section 6 of the act of June 17, 1902:

That the title to and the management and operation of the reservoirs and the works necessary for their protection and operation shall remain in the Government until otherwise provided by Congress.

But the Federal Government is not well adapted to the operation of ditches and laterals and the delivery of water to individual water users. The same principle seems to apply, too, with reference to the operation of power plants, where the best success has been obtained by the Government in operating the power plant but delivering the power at wholesale either to municipalities, such as the cities of Burley and Rupert, or to companies organized to distribute the power to the individual users.

<sup>1</sup> Paper read before the reclamation conference at Denver, Mar. 16-18.

## OPERATION OF CANALS AND LATERALS

Secretary Work early adopted the policy of favoring the turning over of operation and maintenance of ditches and canals to the water users' organizations, and subsection G of section 4 of the fact finders' act provides, in part, as follows:

That whenever two-thirds of the irrigable area of any project, or division of a project, shall be covered by water-right contracts between the water users and the United States, said project shall be required, as a condition precedent to receiving the benefits of this section, to take over, through a legally organized water users' association or irrigation district, the care, operation, and maintenance of all or any part of the project works, subject to such rules and regulations as the Secretary may prescribe, and thereafter the United States, in its relation to said project, shall deal with a water users' association or irrigation district.

Under the adjustment act of 1926 the above requirement of the fact finders' act was waived and it was left to the discretion of the Secretary to determine whether adjustment contracts under the act of 1926 should or should not provide for operation of irrigation works by the water users' organization. But up to the present time no contracts have been made in the northwestern legal division under the adjustment act of 1926 except for the construction of new projects, and the contracts for new projects have provided for the operation and maintenance of all or a part of the irrigation works by the district.

The adjustment contracts made in Idaho were made under the fact finders' act and in all cases required the districts to operate and maintain the canals and laterals, but the Government reserved the operation and maintenance of large reservoirs, such as the American Falls, Jackson Lake, and Lake Walcott Reservoirs on Snake River and the Arrowrock on the Boise River, and this was also true of the principal diversion dams where the dam serves more than one canal system. The same plan was followed in the contract with the Kittitas reclamation district, the district agreeing to operate and maintain the canal system, the operation and maintenance of the reservoir system being left to the Government.

Placing the responsibility for the operation and maintenance of the canals and laterals on the district, and also placing on the district the responsibility for making collections and for the payment of a lump sum to the Government, tends to develop a constructive and conservative attitude on the part of the water users. The water users, knowing that they must depend on the directors that they themselves elect for their water service, usually select good men, and under responsibility even the radicals tend to become conservatives. This is

one of the factors which is partly responsible for the improved conditions on the Idaho projects since the new contracts were made.

### DISTRICT ORGANIZATION NECESSARY

The Secretary of the Interior also very wisely adopted the policy of making adjustment contracts on the projects in the Northwestern States only with irrigation districts. Every division of every project in Idaho, Oregon, and Washington is now organized as an irrigation district. The Tieton division of the Yakima project still functions for some purposes through a water users' association, but an irrigation district has been organized and covers the same territory covered by the association. The Tieton division of the Yakima project is the only remaining division of any of the northwestern projects which now functions even to this limited extent through a water users' association.

By the use of the irrigation district form of organization the taxing power of the district is made available to assist in the collection of charges and the collection is also placed on a more automatic basis. In place of the guarantee given by the water users' associations there has been substituted a direct agreement by the district to pay the construction charges and also the charges for the operation of the reserved works in a lump sum, which obligation is a general obligation of the district; and provision is made in the contract for making assessments sufficiently large to provide a reasonable margin to cover such delinquen-

cies as may be anticipated from past experience. This change is also, in part, responsible for the improved conditions.

So far as I can learn, the guarantees given by water users' associations were never of any practical effect except in the case of the Orland association. In that case it is my understanding that, while the contract provided for a guarantee by the association, the association voluntarily treated the contract as one providing for a direct obligation on the part of the association to make payments in a lump sum for the entire project. In other words, in the case of the Orland association the association voluntarily adopted the policy of making collections and payments on much the same basis which is now required under the new contracts with irrigation districts; that is, the association itself made the payments for the entire project in a lump sum and levied assessments with a sufficient extra amount to cover reasonable allowance for delinquencies.

### COLLECTION OF CHARGES

While the new contracts provide for collection of charges by means of the taxing power of the district, the right to enforce payment by withholding delivery of water is not waived, but, on the contrary, the district is required to use all available means of collection, including both the use of the taxing power and the withholding of delivery of water from those who are in arrears more than one year. The contracts also contain a provision under which the amount of water delivered to the district may be reduced in proportion to delinquencies.



Concrete lined lateral on the Salt River project, Arizona



On each project there are many details which must be covered by special provisions in the contract, but, as I see it, the provisions above outlined are the main general provisions common to all of the contracts where improved conditions have resulted from the making of a new contract. Our experience indicates that important points to be covered by such contracts include the following:

(a) The contract should be with an irrigation district so that the taxing power may be available to aid the organization in making the necessary collections.

(b) The contract should require the use of all means of collection, both by the exercise of the taxing power and by the exercise of the right to withhold delivery of water in cases where payments are more than one year in arrears.

(c) The contract should avoid the folly of relying on a mere guarantee and should require the district organization to make a direct agreement to pay to the United States a lump sum covering their entire annual installment of the construction charge coming due each year from each project or division of a project, and should also require the district to collect and pay its own operation and maintenance expenses, including the operation and maintenance of the canal system, and to pay in advance to the Government the operation and maintenance cost of the reserved works.

(d) The responsibility for the operation and maintenance of the canals and laterals should be placed in the district, both for the reason that the Government is not well adapted to operate the ditches and laterals and deal with individual water users and also for the reason that this responsibility when placed on the water users' organization is very helpful in developing a conservative and constructive attitude on the part of the water users.

(e) In cases where there are large reservoirs serving a number of different projects, or large diversion works diverting water for two or more canal systems where the systems are under different management, it is usually best that the Government reserve the operation and control of such reservoirs and diversion works.

(f) Our experience also indicates that where power plants are involved it is usually best to handle the power plants under a similar system, the Government operating the plant but selling the power at wholesale either to municipalities which distribute it to the individual users or to companies formed for that purpose.

On several of the projects in the Northwest we are still struggling with contracts and organizations which do not meet all of the desired requisites. In such cases, even on the best projects, of which the Tieton division of the Yakima project is a good illustration, the amount of delinquent charges continues to increase from year to year, and, while a good record of payment has been made in some cases, the tendency is toward a less favorable rather than a more favorable condition both as to amount of delinquency and as to the relationship between the Government and the water users.

### SUCCESS DEPENDS UPON PROJECT FEASIBILITY

While a proper form of contract with a district organization is very helpful in putting a fairly feasible project on its feet and in improving the relations between the Government and the water users, it should not be assumed that a contract containing the provisions above outlined is a panacea for all the ills of all reclamation projects. Unless the physical conditions as to soil and water supply, markets, etc., are sufficiently favorable so that crops sufficient to support the farmers and leave a surplus available to pay water charges can be produced, no form of contract can make a success of the project or secure the payment of the charges, and, regardless of the form of contract, it is also necessary that the terms of payment be within the ability of the average water user to meet. The mistake should not be made of picking out a few especially capable or especially fortunate individuals and assuming that the average irrigation farmer can meet the conditions which could be met by such exceptional individ-

uals. Allowance must be made in each case for the peculiar local conditions which affect each of the projects and which can be determined and provided for only by means of a very careful study of the conditions applying to each case. We are still struggling with many projects on which there are many unfavorable conditions, some of which could be improved by better contracts and better organizations and some of which could not. The contracts for new projects contain a provision requiring that in the event of the sale of land at an increased price one-half of the increase in value shall be applied to the payment of water charges on the land in question.

### REDUCING SPECULATION

This provision was first included in the contract with the Kittitas reclamation district and was later included in the various contracts in connection with the Owyhee project and the Vale project and in the proposed contracts for the Gooding and Black Canyon projects. This provision has caused more discussion than any other provision in the contract and has been the subject of many comments both favorable and unfavorable. In principle it is generally admitted to be correct, but as applied to specific cases it is often claimed that it is unworkable or that appraisals have been made at too low a basis and have depressed prices and loan values.

As it is one of the purposes of this provision to protect new settlers against inflated prices for raw lands, by providing that in case increased prices are paid for the land the new settler will at least have his water charges paid up for a number of years to come; some of the complaints that this provision is holding down land prices would seem to indicate that this provision and the appraisals made under it are already having some effect.

On many of the old projects prices of raw sagebrush land during boom times have been run up to as high as \$100 per acre, which is in addition to the cost of the water and the expenses necessary for improvement and reclamation. As most of these sales were made on the partial-payment plan and the deferred payments bear interest, the land charges added to the water charges created a crushing burden. The arid land in itself was almost worthless and the high prices secured were due almost entirely to the prospect of securing water from works constructed with Government money furnished without interest. In this way land speculators often reaped the reward of the Government's bounty to the detriment of actual settlers and of the project.

This evil has been often observed and commented on, but it is very difficult to find a remedy.



Sheep in the Kittitas Valley, Yakima project, Washington



## Irrigation in Central Otago, New Zealand

AN interesting publication has been received by Commissioner Mead through the courtesy of F. W. Furkert, engineer in chief of the public works department, Wellington, New Zealand, describing the growth and present status of irrigation development in the Province of Otago, in the southern part of the South Island.

Analogous to the irrigation history of most of our Western States, irrigation had its birth and spread from the placer-mining regions in the mountain valleys when the placer fields became exhausted. The author describes this transition period in the following paragraph:

In due course the gold boom died a natural death and the floating population attracted to central Otago by the gold lure gradually drifted away. A few miners living in hope or too old to break fresh trails remained on their claims, but finding that the amount of gold procurable would barely suffice to keep them in food and clothing, were forced to augment their scanty earnings by the growth of vegetables and such produce as they required for their own use. Realizing from bitter experience the futility of depending upon the rainfall for moisture sufficient to the needs of their crops, they utilized the water races primarily designed to facilitate the extraction of gold from the soil for the purpose of conveying water to their crops in time of drought. This, then, was the birth of irrigation in central Otago.

For many years irrigation was confined to the diversion of small streams over the adjacent lands by private operatives. The soil fertility and climatic conditions, combined with the human energies, resulted in the creation of a type and quality of agricultural output nowhere surpassed.

This process of development soon found its natural limitations in the lack of capital, and remained so restricted until during the past decade considerable progress has been made by the establishment of several fairly comprehensive Government irrigation works and numerous smaller project schemes. Considering the limited territory and the generally unfavorable topography of the region, this progress speaks well for the enterprise of these people.

### HUMAN NATURE THE SAME

It is interesting to note the similarity in the human reactions to a given set of conditions. This is illustrated by the following paragraph taken from the pamphlet:

Although irrigation farming is older than any other kind of highly developed

agriculture in the world, it is nevertheless a fact that the average settler in New Zealand has had no experience in its practice. Since the advent of irrigation in central Otago people of all sorts and conditions have been coming there to take up land. Most of them come with the purpose of making comfortable homes on the land and of earning a living by farming, but one finds among them many individuals who know little or nothing of farming, as well as those who lack the physical qualities necessary to cope successfully with the varying conditions of a settler's life.

It is not generally recognized that it takes as much capital and more agricultural skill to develop and bring into production an irrigated farm than is required to successfully farm in a humid district.

### THE SOILS

From the general description the soils of this region are of high quality, having been built up from the softer portions of the metamorphic schists, the chemical constitution of which has imparted a happy combination of physical and chemical characteristics. Again quoting from the pamphlet, this situation is described by Mr. B. C. Aston as follows:

Mr. B. C. Aston, writing in the Journal for June last, gives it as his opinion that "the fertility of the mica-schist soils of Otago is due not to lime or potash or to the total amount of phosphoric acid they contain, but to the comparatively large amount of available phosphoric acid present, a point of great theoretical and practical importance." The fact that available phosphate is abundant in these Otago soils but deficient in most New Zealand soils, especially those of the North Island and northern parts of the South Island, suggests that some day central Otago, with its splendid summer climate and irrigation possibilities, will become one of the finest farming districts in New Zealand.

The same writer points out that this amount of available phosphoric acid would probably equal a dressing of from 8 to 16 hundredweight of phosphoric acid per acre, which would take from 2½ to 5 tons of superphosphate to supply. If the computation is correct, then the marvelous results obtained from this soil are explained.

### RAINFALL

The rainfall over the South Island presents very similar characteristics to the rainfall in the North Pacific States, being rather excessive along the west coast and deficient east of the mountain ranges. The portion over which these irrigation projects extend in central Otago is generally favored with an average annual rainfall of about 15 inches, varying from 12 to 20 inches during the

growing period, October to March, inclusive, with a minimum of two-thirds of an inch during the hottest month, which is February. During this month the mean shade temperature for the month is 79° F.

### IRRIGATED AREA

The extent of irrigation so far developed and in course of completion as well as the additional tracts to be developed, are shown in the following summary:

	Area actually under irrigation on Jan. 30, 1924	Works under construction mostly expected to be completed during 1924	Areas investigated and considered feasible for development by gravitational water supply	Further areas estimated as probably irrigable when cheap power is available for pumping	Total
Govern-ment.....	Acres 21,400	Acres 42,400	Acres 280,750	Acres 42,350	Acres 386,900
Individual.....	10,000				10,000
Company.....		5,000			5,000
Local body.....	4,350	3,350			7,700
Total.....	35,750	50,750	280,750	42,350	409,600

When one considers the restricted territory, combined with the rugged topography, the development which has taken place within the past decade is remarkable and the schemes which are proposed look ambitious. Its past success has been built on the basis of a diversified system of farming, including dairying and the raising of beef or mutton; in addition, certain favored areas are well adapted to fruit growing. These products find their principal outlet in the United Kingdom and consist, for the total of New Zealand, principally of wool, 25 per cent; meat, 25 per cent; butter and cheese, 20 per cent; and hides and skins, 9 per cent.

### NEW ZEALAND A GREAT COUNTRY

Speaking of New Zealand as a whole, the importance of this Commonwealth is worthy of note. With a population of only 1,220,000, her total trade was \$375,000,000 per annum during 1919-1921, giving a per capita exceeded by that of few other countries. Her imports average \$180,000,000 and her exports \$195,000,000. Of the imports the United States supplied 18 per cent.<sup>1</sup>

The first chapter of the pamphlet is a splendidly condensed narrative of human accomplishment made possible by well-directed Government aid. The remaining chapters are devoted largely to principles and practices of irrigation which are modern and equally applicable on our own projects.

<sup>1</sup> "Our Competitors and Markets." Lahee.

## Organization Activities and Project Visitors

**D**R. ELWOOD MEAD, Commissioner of Reclamation, returned to the Washington office about the end of May after an absence of two months and a half, during which he attended the Pan Pacific Conference in Hawaii and visited a number of the irrigation projects of the bureau.

Miss Mac A. Schnurr, secretary to the commissioner, returned to Washington the latter part of May. Miss Schnurr spent some time in the Lower Rio Grande Valley as secretary of the Commission on the Equitable Use of the Waters of the Rio Grande, later meeting Doctor Mead at Yuma and accompanying him to several projects and other points in the Northwest where water users' hearings were held. She will resume the woman's page in the July ERA.

The special advisers on the Colorado River, appointed by the Secretary of the Interior, including Governor Emerson, of Wyoming, ex-Governor Scrugham, of Nevada, Mr. Watterman, Senator-elect from Colorado, and Professor Durand, of Stanford University, met Secretary Work, Commissioner Mead, and Chief Engineer Walter at Yuma, Ariz., the latter part of April to consider the problems of the development of the Colorado River Basin.

A conference was held recently at Pullman, Wash., with Prof. George Severance relative to the investigations to be made of typical tracts selected for study of

### Federal Reclamation Laws Annotated

The legal division of the Washington office of the bureau has recently issued a revised edition of Federal Reclamation Laws Annotated. The volume embraces the enactments of Congress pertaining to reclamation from the organic act of June 17, 1902, to those of the recent session ending March 4, 1927, as well as some earlier statutes affecting irrigation operations of the Federal Government. The annotations include digests of decisions of the courts, the Comptroller General, the Attorney General, the Department of the Interior, and the Bureau of Reclamation. Copies may be obtained from the Bureau of Reclamation, Washington, D. C., at the price of \$1 each for the cloth-bound volumes and 50 cents each for those bound in paper.

economic phases on the Columbia Basin project.

H. R. Pasewalk, formerly chief clerk on the Strawberry Valley project, has been appointed chief clerk on the Yuma project to fill the vacancy caused by the resignation of Marion J. Gorman.

A board of engineers comprising Consulting Engineer A. J. Wiley, Engineer B. W. Steele, Construction Engineer H. J. Gault, and Project Superintendent R. C. E. Weber, met recently on the Orland project to report on various construction details of the Stony Gorge Dam.

Charles S. Hoag, junior engineer on the Grand Valley project, has been transferred to the Gooding project, Idaho.

F. O. Osborn, chief appraiser for the Denver Joint Stock Land Bank, spent several days on the Uncompahgre project obtaining information with a view to making loans on the project under the amortization plan after the execution of the proposed contract providing for adjustments on the project.

G. H. Hogue, assistant engineer on the Boise project, has been transferred to the Minidoka project.

C. M. Day, mechanical engineer from the Denver office, was on the Boise project recently looking over Arrowrock valves and conducting tests of the Black Canyon pumps. He also visited the Minidoka project and inspected the work being done on the installation of the sixth unit at the power house.

C. A. De Kay, engineering draftsman on the Milk River project, has been transferred to the North Platte project.

Recent visitors on the Milk River project included J. McKittrick and C. A. Parkhill of the Spokane Branch of the Federal Land Bank; E. C. Leedy, general agricultural development agent of the Great Northern Railway; C. D. Greenfield, Leonard Ball, and P. J. Wagner, agriculturists and colonization agents of the Great Northern; and George C. Kreutzer, director of reclamation economics.

H. W. Lawler, general superintendent of construction for the Utah Construction Co., spent several days recently at Gibson Dam, Sun River project.

H. W. Byerly, general immigration agent of the Northern Pacific Railway, was a recent visitor on the Lower Yellowstone project.

John K. Rohrer, junior engineer on the North Platte project, has been transferred to the Minidoka project.

E. W. Kronquist, irrigation engineer of the Bureau of Indian Affairs, visited the Newlands project recently to look over the drainage work in progress.

The Italian aviator, Francisco de Pinedo, landed on Elephant Butte Lake, Rio Grande project, on April 4 and left on April 6.

George C. Kreutzer, director of reclamation economics, was on the Belle Fourche project recently to confer with the district board and local organizations on matters pertaining to industrial development and settlement of the project.

### Discount Received for Prompt Payment

Reports received from all the projects relative to discounts received for prompt payment indicate that discounts are taken on a large percentage of the purchases. The extent of this saving to the water users is shown in the following:

Period	Purchases		Discounts realized	Per cent of purchases
	Number	Amount		
July 1, 1926, to Apr. 30, 1927	9,195	\$1,265,258.22	\$12,648.91	1
Prior to July 1, 1926	112,764	22,882,649.65	221,516.23	.968
Total to Apr. 30, 1927	121,959	24,147,907.87	234,165.14	.969

From the above it is seen that discounts have amounted to approximately 1 per cent of total purchases, a record of which the Bureau of Reclamation may justly be proud and undoubtedly a source of gratification to the water users.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary; J. H. McNeely, Assistant to the Secretary; W. B. Acker, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

George C. Kreutzer, Director of Reclamation Economics

P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Bella Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	W. L. Vernon.....	B. E. Stoutemyer.....	Boise, Idaho.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	M. M. Wilson.....	E. E. Roddis.....	Billings, Mont.
King Hill <sup>2</sup> .....	King Hill, Idaho.....	.....	.....	.....	.....	.....
Klamath.....	Klamath Falls, Ore.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	do.
Minidoka <sup>3</sup> .....	Burley, Idaho.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Ore.
Newlands <sup>4</sup> .....	Fallon, Nev.....	A. W. Walker.....	.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte <sup>5</sup> .....	Mitchell, Nebr.....	H. C. Stetson.....	L. H. Mong.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Ore.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Owyhee.....	Adrian, Ore.....	F. A. Banks.....	.....	.....	B. E. Stoutemyer.....	Portland, Ore.
Rio Grande.....	El Paso, Tex.....	L. M. Lawson.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	E. B. Smith.....	R. B. Smith.....	Wm. J. Burke.....	Mitchell, Nebr.
Salt River <sup>6</sup> .....	Phoenix, Ariz.....	.....	.....	.....	.....	.....
Shoshone <sup>7</sup> .....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley <sup>8</sup> .....	Provo, Utah.....	.....	.....	.....	.....	.....
Sun River.....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	do.
Umatilla <sup>9</sup> .....	Hermiston, Ore.....	.....	.....	.....	.....	.....
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Vale.....	Vale, Ore.....	H. W. Bashore.....	C. M. Voyer.....	.....	B. E. Stoutemyer.....	Portland, Ore.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	do.....	do.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	M. J. Gorman.....	E. M. Philbaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	F. A. Banks <sup>10</sup> .....	H. N. Bleckel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Ore.
North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>10</sup> .....	.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>11</sup> .....	E. R. Mills.....	.....	B. E. Stoutemyer.....	Portland, Ore.
Sun River, Gibson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>11</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Damsite, Elk Creek, Calif.....	H. J. Gault <sup>11</sup> .....	C. B. Funk.....	.....	R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Orland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

<sup>10</sup> Resident engineer.

<sup>11</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise.....	Boise, Idaho.....	R. J. Newell.....	Middle Rio Grande conservancy district.
Middle Rio Grande.....	Albuquerque, N. Mex.....	C. C. Elder.....	
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	
North Platte (Casper) pumping.....	Guernsey, Wyo.....	F. F. Smith.....	State of Wyoming.
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	Poudre Valley Water Conservation Association.
Cache la Poudre.....	Denver, Colo.....	Thos. Hawthorne.....	
Columbia Basin Project.....	Indi, Wash.....	B. E. Hayden.....	
Truckee and Carson River.....	Reno, Nev.....	A. N. Burch.....	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



FIRST CUTTING OF ALFALFA, RIO GRANDE PROJECT, NEW MEXICO-TEXAS

18, no. 7

# NEW RECLAMATION ERA

VOL. 18

JULY, 1927

NO. 7



ONE OF THE RESERVOIR SITES ON THE PROPOSED COLUMBIA BASIN PROJECT



PRESIDENT COOLIDGE  
COMMENDS  
GOVERNMENT EMPLOYEES



*I WANT you to know I appreciate what you have done. I am sure the people also realize and value your efforts. They are giving closer and closer attention to the operations of their Federal Government. Their interest is essential to its perpetuation. They know what has been done and what is being done in their behalf. There must be no relaxation of effort. Wiser from the lessons of the year just closing, we should the more intelligently attack the problems facing us the coming year and more scientifically appraise our needs for the year following. To do more work and better work with a smaller outlay of the taxpayers' money is the supreme test of successful administration.*

*—From President Coolidge's address before the Business  
Organization of the Government at its thirteenth  
regular meeting, June 10, 1927.*

# NEW RECLAMATION ERA

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HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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## *Interesting High Lights on the Reclamation Projects*

**P**RESIDENT Coolidge has selected for the location of the summer White House a spot only 85 miles from the Belle Fourche project, whose farmers have within easy distance the attractiveness and recreational opportunities of the Black Hills.

**T**HE Belle Fourche irrigation district met all contract requirements by prompt payment of \$50,000 in cash on May 20. This entitled the district to water service during the season, and all individuals who have paid the last assessment are eligible to begin irrigation. An associate reclamation economist was assigned to the project on May 1 to assist in the program mapped out for development along the lines of settlement and agricultural improvement.

**A**T Gibson Dam, Sun River project, 11,000 cubic yards of earth and loose rock and 2,000 cubic yards of solid rock were excavated from the north abutment during the month. Work was continued on the spillway tunnel and on the erection of the concrete plant. Excavation of the south abutment was nearing completion.

**T**HE poultry and dairy industries are in a flourishing condition on the Newlands project. Approximately 100,000 turkeys will be raised this year. Six thousand dairy cows are now on the project. It is estimated that there will be 80,000 laying hens by fall.

**A**IRPLANE maps have been made recently of the territory along the Yakima River from Union Gap to Pomona, and along the Naches River from its junction with the Yakima River to the mouth of the Tieton River. The photographs were taken by Lieut. W. R. Taylor, of the Army Air Corps, at an elevation of about 10,000 feet, the scale being 633½ feet per inch. The maps will be used in the proposed adjudication of the waters of the Yakima River.

**A**T Stony Gorge Dam, Orland project, excavation continued and at the end of the month the screening and mixing plants were practically completed and ready to make concrete. The total amount of excavation was estimated at 14,042 cubic yards of rock and 9,240 yards of earth and loose rock.

**F**EES for the appraisal of lands, aggregating 1,910 acres, had been received at the end of the month by the Orland Unit Water Users' Association under the cooperative plan for advertising and selling project lands. About 1,800 acres had been appraised by the appraisal board and reports submitted to the landowners to sign the optional agreements, listing their holdings with the bureau for sale to new settlers. It is expected that at least 2,000 acres of the 3,500 acres available will be listed for appraisal.

**T**HE organization of a cooperative livestock marketing association is being perfected on the Grand Valley project. A considerable number of hogs have been shipped to the Los Angeles market through this agency with very satisfactory returns.

**T**HE organization of a poultry marketing association is in progress on the Grand Valley project, and it is believed that a flourishing organization can be formed. Poultry has increased greatly during the last few years, and the shipment of eggs, chickens, and turkeys has reached considerable proportions.

**T**HE annual spring rise of the Colorado River continued throughout the month. The month's total run-off was 11 per cent above normal. Owing to cold weather on the upper watershed, discharges there were lowered 40 per cent with a resulting flat peak at Yuma the 1st of June of 74,000 second-feet.

**T**HE Kraft Cheese Company, with headquarters in Chicago and a processing plant at Pocatello, has purchased three cheese factories on the Minidoka project. The Rupert factory is now installed at a new site about a mile south of the city.

**T**HE Minidoka County Wool Pool sold its 1927 clip and loaded it out at Rupert on May 31. The deal involved 52,617 pounds of wool and the price received was 30½ cents a pound. The wool was contracted to Adams and Leland, of Boston.

**S**HIPMENTS of agricultural products from the Yuma project totaled 338 carloads valued at \$65,385, making a total since the first of the year of 2,319 carloads valued at \$1,237,485.

**T**WENTY acres of citrus fruit trees were set out on the Yuma Mesa during May, making a total of 170 acres planted up to that time this year and a grand total of 945 acres. This will practically close the planting season until after the hot summer months.

**T**HE general optimistic attitude on the Belle Fourche project and the publicity regarding the agricultural opportunities have resulted in continued inquiries concerning the project. Two farms were sold during the month, one at \$3,200 and one at \$10,000.

**T**HE sixth unit at Minidoka power house was put in operation in June.

**D**URING May 11 entrymen, making a total of 82 entrymen, had been awarded units and filed water-rental applications on farm units in the Tule Lake division, Klamath project. About eight applications were on file with the examining board at the close of the month.

## Planning the Columbia Basin Development<sup>1</sup>

*The greater cost of irrigation works and the larger expense involved in the development of farms are forcing reclamation authorities everywhere to give more attention to those things which will increase farm income, because it is the farmer who pays the bills.*

*By Dr. Elwood Mead, Commissioner, Bureau of Reclamation*

ALL who have watched the operations of the Columbia Basin League have a profound respect for the intelligence, persistence, patience, and tact with which it has advocated this development of the resources of the Northwest. It is entitled to, and is receiving, the sympathetic cooperation of the friends of reclamation. It has been a helpful influence in the cooperative work carried out by the State and the Bureau of Reclamation.

The Washington congressional delegation has been equally efficient. Without its persistent and effective action the appropriations for gathering information about the project and preparing plans for its development could not have been secured.

No reclamation development is simple. It includes the settlement of water rights, the solving of engineering problems, the improvement of farms, and the creation of an agricultural program. It takes in law, engineering, agriculture, and economics; and the larger the project, the more important it is that all these different factors be thoroughly thought out in advance and arrangements made by which each will contribute its share to a final successful development. This serves to explain the investigations made of this project in the past, and I hope to-day to point out the benefits which will come from continuing these investigations until satisfactory arrangements have been made for every detail of this scheme.

An interstate agreement is needed which will insure an adequate water supply for this project and provide for the largest use of the water supply of the Columbia River and its tributaries in all the States. A commission made up of representatives of the States of Montana, Idaho, Washington, and Oregon and of the Federal Government has been at work on such an arrangement. A conference held on Wednesday of this week indicates that a satisfactory agreement may be anticipated, but it also shows that to reach this, in a way that is most satisfactory to the States which furnish the water, some modification in the original storage plans will be necessary.

Too great a disturbance of the natural reservoirs, like Cocur d'Alene and Pend

Oreille, would not have the approval of those who live around these bodies of water and should be avoided if alternative storages can be provided. Investigations indicate that this can be done and that the result will be less disturbance to existing conditions in Idaho and Montana and a decided increase in the reclamation development of those States as a factor in this huge program of conservation. But to know definitely what can be done, and to be able to submit reliable estimates of cost, further investigations of foundations and storage sites must be made and should be provided for at the next session of Congress.

The extensive experience of the Reclamation Bureau in carrying out engineering investigations of this character will make its cooperation a useful factor, and I believe that this can be arranged. The Bureau of Reclamation has built the highest dam in the world and is now preparing plans for another of still greater height. This accumulated experience can be made available in the determination of how the water of the upper Columbia should be conserved.

At the conference Wednesday there was a noted absence of desire on the part of any State to secure any narrow advantage, which leads to the belief that when an agreement is reached it will mean cordial cooperation and an absence of friction when actual construction begins.

Arrangements were made for a continuance of these studies. The need now is for additional facts, the collection of which will require the establishment of additional gauging stations to know what streams contribute the water supply of the Columbia and a study of reservoir foundations to know the best place to locate supplemental storages.

### FINANCING THE PROJECT

If the Government builds this project it will have to do it under a plan of financing different from that employed at present. This and the Boulder Canyon project, on the Colorado, will require so large an amount of money that neither can be built out of reclamation income.

There is no difficulty in arranging for the financing of Boulder Canyon because of the fact that the largest irrigation district in the United States, already settled and wholly improved, will be the purchaser of water and will be benefited

\$1,000,000 a year by the removal of the silt problem alone. The project will generate more than a half million horsepower, for which there is, at present, a large and growing demand in the city of Los Angeles, insuring an immediate, long-time contract for its purchase.

The conditions here are entirely different. This project will have to depend mainly on the creation of a profitable agricultural development on an area hitherto dry farmed. It will be necessary here to show how that development is to be brought about and what results may be anticipated in order to convince Congress that the expenditure is justified. Here is an expenditure of more than one-half billion dollars, whereas the annual income to the reclamation fund has averaged only \$8,500,000 for the past five years.

This income is derived mainly from sales of the public land, income from leases of oil lands, and the construction repayments made by settlers on existing projects.

Last winter the Secretary of the Interior submitted to Congress a construction program to extend over a period of 10 years. His purpose was to show the amount of money which would be required to complete works on which construction had already begun, and the time necessary if we have only the income to the fund to use. The Secretary recommended that no new works be made a charge on this fund until those under way are completed.

It happens that the State of Washington will receive a large share of the fund. That is due to the immense extent of the Yakima project, which has been under construction for nearly 20 years and which will require 10 more years to complete. The valuable natural storages on the stream will enable nearly the whole flow of the river to be used in a region of rich soil and favoring climate.

After the existing works are completed, there are a large number of favorable opportunities for the construction of new works of relatively small cost which will absorb the fund for many years to come. Great projects like Columbia Basin and the Boulder Canyon development of the Colorado must, therefore, look to appropriations from the Federal Treasury for their completion.

Nearly everyone familiar with reclamation conditions is coming to believe that

<sup>1</sup> This address was broadcast and delivered before an audience of about 750 people at a meeting May 20, 1927, of the Columbia Basin Irrigation League, Spokane, Wash.

the day of private development has passed; hereafter reclamation will be mainly carried out with public funds as a part of a public policy.

That is the history of other countries. India, Egypt, Australia, South Africa, Mexico, and Peru are illustration of the disappearance of private enterprise and making irrigation works a public enterprise. That being the case, means for financing the conservation of the great rivers of the arid region must be worked out and an early solution of this is desirable.

In 1924 and 1925 Congress, by the passage of the fact finders' and adjustment acts inaugurated a new era in our economic development through reclamation. These acts require that greater attention be given to the soil and its possibilities, the kind of crops and cultivation which ought to be adopted. The capital and experience of the settler are given their proper importance, and a beginning has been made in the creation of planned rural communities.

These changes were made in the belief that they would contribute to the creation of happy and prosperous homes and would speed up earning power of farms and the return of the money invested in works. Enough experience in the operation of these laws has already been gained to show this value. It has necessitated increased activity on the part of the Bureau of Reclamation in economics and settlement. The division of reclamation economics has been created and the chief engineer, Mr. Walter, and the director of reclamation economics, Mr. Kreutzer, work together, both in the preparation of plans for new projects and in the things necessary for the fuller development of the old ones.

#### **FORMATION OF IRRIGATION DISTRICT ALONE NOT SUFFICIENT**

It is the policy of the department to require the organization of an irrigation district and the execution of a contract with this district for the repayment of construction costs as a preliminary to beginning construction. These districts are organized under the laws of the different States, which vary somewhat in details, but all make the obligation to repay construction costs a first lien on the land, the payments being collected as taxes. The Reclamation Bureau is thus relieved of the task of collecting from individuals who are in arrears.

If this were done in the case of the Columbia Basin project, there would be no serious difficulty in securing a lien which would be legally superior to any private mortgages. The irrigation dis-

tricts make their collections through the taxing power, and the tax lien is always superior to private mortgages and liens of all sorts.

From a practical standpoint, however, the success of the project may depend upon the total obligation which the settler is obliged to meet. If the mortgages are heavy the settler is likely to find the total burden of assessments for water charges and payments on the interest and principal of the mortgage indebtedness heavier than he can carry, and in that event the assessments for payment of the water charges are likely to become delinquent. Where the mortgages are heavy, the mortgage holder should be considered as the real owner and required to join in the same excess land contracts and recordable agreements as are required of the landowners.

Making construction costs a first lien on unimproved or badly farmed land does not insure the payment of these costs. Intensive cultivation of the soil is the only safe guaranty of solvency. The Bureau of Reclamation and the holders of millions of dollars of irrigation bonds of private projects are convinced that a district obligation has little value unless the land is settled and properly farmed.

What then must be done to insure the prompt settlement and cultivation of these lands? To answer this we must know who owns them; we must know something of the owners' views and plans. Do they intend to build houses, level land, sow alfalfa, and set out orchards, or do they intend to sell the land when the canal creates a demand?

If the same procedure is followed here as is being carried out on the Vale, Owyhee, and Payette projects, the land will be appraised and the owners will be required to agree in writing to offer their land for sale at the appraised price and on terms approved by the department.

In the light of reclamation experience it will not be sufficient to rely on a district contract which gives a lien on unsettled land. There must go with such district contract plans for settlement and farm development which the department and Congress will accept as feasible. That a district lien on unsettled land with no settlement program is not a safe basis for development is shown by what has happened in older districts where payments were so secured.

The reason for nonpayment is lack of good farmers. The reason for non-collection is that no one will buy the land when offered at tax sale. Year after year the tax debt against lands in some of the Federal districts has accumulated. Year after year the Reclamation Bureau has to keep the projects going with money

from the Federal Treasury. The thrifty, successful settlers were discouraged and anxious; realizing that they could not pay all charges on their fraction of the district many of them left.

That situation will certainly arise on this larger project if adequate provision is not made for securing good farmers and for prompt development of the farms.

Under a cooperative agreement with the State, the Bureau of Reclamation is gathering statistics as to who owns this land, what use is being made of it without irrigation, mortgage indebtedness, and owners' selling prices. These will have an important relation to settlement plans.

Since coming here I have talked with those who are gathering this information. They report that the land is farmed mainly by tenants, that the owners are scattered all over the country. These renters farm from one to five or six sections. They report that their crop returns run from 8 to 15 bushels of wheat to the acre. There is no profit in this, simply a living, as the owner gets only one-fourth to one-fifth of the return from the crop. Farther west dry farming has been practically abandoned.

The owners of this land are looking to the building of an irrigation work and have fixed prices from \$20 to \$100 an acre. In the drier country a great deal of the land has been sold for taxes and is now owned by the counties.

In two reclamation districts the bureau has, during the present year, become a colonizing and selling agent for 10,000 acres of land on each project. The owners have agreed to sell at a price to be fixed by impartial appraisers, with 20 years in which to pay for the land; payments to be amortized, interest to be 6 per cent. It took a year to secure these agreements. It will probably require longer here.

One mortgage company put in 22 farms. Owners were scattered throughout the country. Coordinated action on any other plan would have been difficult, if not impossible.

The railroads reaching these projects are cooperating with the Government as they could not with individual owners. States and local chambers of commerce are rendering help. The bureau has issued publications giving lists of these farms, the improvements on each, the payments to be made, and advising as to the assistance which would be given. Agricultural and social conditions are carefully stated.

This experience is showing the value to settlers of having the farms partly improved. Improved farms on both these projects are being occupied and cultivated this year. It is hard, on the other hand, to sell farms wholly unimproved.

Many settlers would buy if a house was on the land, with its cost included in the purchase price, but they lack money to meet the first payment on the land, build a house, prepare the land for irrigation, and grow the first crop, and these things all have to be done to make the farm a going concern.

#### NEED FOR FUND TO MAKE ADVANCES TO SETTLERS

If we had money from which to make advances to settlers, equal to one-half the cost of a house after it was built, that advance money would enable the settler to level his land and then if an advance could be made on one-half of the cost of leveling the settler could use that reduced sum to make other improvements or help meet living expenses for the first year.

Experience of other countries has shown that such advances are essential to the success of reclamation. They should be made by some one in direct contact with settlers. Advances should not exceed one-half of the outlay in labor or money made by the settler on these necessary improvements. Unless some such assistance can be provided, the completion of huge projects like this one will be slow and the success of Federal reclamation uncertain.

On one project we have agreed to spend a million dollars for drainage. Much of the land is now unoccupied. The drainage will do no good unless the land is farmed. If we could, when the drains are completed, have a quarter of a million dollars to supplement the settlers' expenditures in fixing up their farms, the repayment of drainage costs would be much more rapid and certain.

At a recent reclamation conference in Honolulu the chairman of the State Rivers and Water Supply Commission of Victoria, Australia, said that the first step in their development was the purchase, by the Government, of land to be reclaimed; they sold the farms on 34 years' amortized payments, with 5 per cent interest. They required settlers to show experience, character, and the possession of \$2,500 in cash or farm equipment, and to these settlers they had advanced up to \$6,000 to enable them to complete the development of their farms. The Government aids settlers by the preparation of the land for irrigation; it makes advances on houses, on leveling and other permanent improvements up to 50 per cent of their cost.

In the discussion of this plan which followed, it was brought out that the Government has no misgivings about the results. It developed that in the State of Victoria the Government has not in 20 years lost anything in making these advances. Occasionally a settler fails to

meet his payments, but he is promptly evicted and the Government has been able to sell these improved farms for more than enough to repay for delays and eviction expenses. The expenditures for improving farms are all being repaid. It is the feature of their policy, as stated by the chairman, which is doing much to enable settlers to meet irrigation charges.

The greater cost of irrigation works and the larger expense involved in the development of farms are forcing reclamation authorities everywhere to give more attention to those things which will increase farm income, because it is the farmer who pays the bills.

In the report of the special commission which reviewed this project in 1925, there is a recommendation that the Government buy all of the privately owned lands as a means of working out the best arrangement of farms and their more rapid and successful settlement. That is the policy in dealing with privately owned land in most other countries and it has great advantages. We are endeavoring to avert this by securing options, but it involves a considerable outlay and the exercise of much time and patience in bringing the different landowners to accept any plans adopted.

On the Kittitas project a subdivisional plan of a part of the area was worked out in which land lines are ignored. The controlling factor is the slope of the land; the farmers' roads and ditches are all fitted to the contours. Everyone who has studied this plan realizes that it is a great improvement over having farms follow the compass regardless of the slopes.

Over in the Tieton district the farmers are changing the shape of their farms by selling to neighbors areas which naturally irrigate from the neighbors' ditches, and purchasing from neighbors land which they can irrigate from theirs. This is bringing about a more effective scheme of watering and cultivation.

The agreement to become the colonizing agent for a large number of landowners at Owyhee and Vale will, of course, be followed by a study of how the best subdivision plan could be worked out regardless of private ownerships, and there is no doubt that in some cases the farms as sold will include land from the holdings from two or more owners.

The great size of the Columbia Basin project creates possibilities for the creation of an organized rural community planned to function most effectively with all its parts adjusted to each other as are the steel works at Gary, Ind., or the Ford works at Detroit.

The weakness of American agriculture to-day grows out of the fact that for the last 50 years each farmer has attempted

to operate as an individual, whereas in every other industry mass production, scientific management, and the inclusion of all things needed to success have been studied and used. We must now, through the combination of skillful cultivation, the selection of crops best suited to the climate and soil, and marketing arrangements which will direct distribution to the best markets, work out plans to overcome this weakness in agriculture.

The studies being made this year on the Columbia Basin project of ownership, mortgage indebtedness, prices of land, etc., can not be completed with the present appropriation. Provision should be made for a continuance of these economic studies. The necessity for this is increased by the fact that the State of Washington last winter enacted an irrigation district law which is destined to be a very important factor in this development. I have not had time to study all of its details. What study I have given it shows that this act, like the Federal reclamation acts of 1924 and 1925, is a decided advance in the attention it gives to economic development and the things that create earning power.

It may seem to some that this detailed planning is unnecessary, that more could be left to chance. Correct judgment as to this will be helped if we visualize what this project includes.

It means the agricultural transformation of an area nearly twice the size of the State of Rhode Island; it means building over 7,000 miles of road and thousands of bridges over canals and ditches; it means finding 30,000 qualified farmers and building more than 30,000 farm houses on that many irrigated farms. If these houses cost \$1,000 each, that will mean an outlay for houses alone of \$30,000,000. To buy the land, provide farm equipment, set out orchards, and sow alfalfa will involve an expenditure of over half a billion dollars. It will cost over \$3,000,000 a year to maintain and operate the project.

Once developed the area irrigated will be twice that now farmed in the State of Utah, including the lands farmed without irrigation, yet Utah is a great agricultural State.

If the acre crop income equals the average of the Yakima project, and it should, the yearly total will be more than \$90,000,000, or more than the present crop income from all Government reclamation projects, if those irrigated under the Warren Act are excluded.

The country towns on the project will have as many houses and as many people as will live on the farms. More than 60,000 houses will, therefore, be needed.

(Continued on page 101)



## *Settlement and Economic Notes from the Projects*

### *Buildings and Improvements Required on Farms to Attract Settlers*

During the past six months practically every farm on the Belle Fourche and Lower Yellowstone projects and the Malta division of the Milk River project having livable houses and some outbuildings have either been leased or sold. Yet other farms of equally good soil but without buildings have not attracted settlers.

Programs to secure settlers have been in effect on the Belle Fourche and Lower Yellowstone projects since the beginning of the year. This consisted of securing options on farms for sale effective until December 31, 1928. Options were secured on about 10,000 acres at Belle Fourche and 8,000 acres on the Lower Yellowstone project. The selling price of land was arrived at by independent appraisal. Terms of purchase were fixed at 10 per cent as a cash payment and the balance repayable on the amortized plan in 20 years, interest at 6 per cent. Booklets were printed describing the farms for sale, which were sent to or given to those interested in securing farms on the projects. The farms for sale on the Lower



Sugar beets on the Belle Fourche project, S. Dak.

### *Columbia Basin Project*

(Continued from page 100)

To secure the approval of Congress for an undertaking of this magnitude, it must be shown, step by step, how this transformation can be made and what it will include. To attract 30,000 farmers we must show how happy and comfortable homes can be created. We must show farmers, their wives, and families that their welfare and success are the main object of all the plans.

By thinking out what is needed and providing for these needs in advance, much can be done to save time and money for the Government and for settlers. Plans of houses suited to the climate and of varying sizes and cost ought to be made. Buying at wholesale and erecting under some cooperative arrangement will save to settlers one-fourth to one-third of the cost of homes, and provide better homes in less time than if each settler is left to shift for himself. Cheap and comfortable homes will be a great factor in making wives and children contented and in lessening doctors' bills.

Here is a field of rural planning new to us and about which there is wide difference of opinion, but its relation to the feasibility of this, the largest and therefore the costliest enterprise of its kind in the world, is so direct that I have felt warranted in bringing it to your attention.

Yellowstone project were advertised by the Northern Pacific and Great Northern Railway Cos. A large number of inquiries were received.

Fifty-six settlers were secured for the Belle Fourche project, and with few exceptions they selected improved farms. Those interested in the settlement of the unoccupied farms on this project state that as many more desired to settle in this locality but were unable to find farms having suitable houses and outbuildings to shelter their families and livestock. These settlers drove over the project, looked at the farms, and went back home or settled elsewhere.

In general, they liked the country. Land prices or leasing terms were satisfactory. The permanent nature of the irrigation system and the abundant supply of cheap water appealed to them. They appreciated the fact that sugar beets, alfalfa, corn, and grain produced well at Belle Fourche and that sheep raising and dairying was profitable, but they were unable to find farms equipped with good buildings, so they could move in and devote all their time and money to growing crops and acquiring stock to consume the feed to be grown.

Late in the spring of 1927, 30 families came to Belle Fourche at one time. They were experienced beet growers. At the time of their arrival the locality was expe-

riencing the heaviest snowstorm of the year. Houses had to be found for these families. Practically all of the substantial buildings were already occupied. These families had to take what was left or stay in town and incur the expense of boarding and lodging. The resourcefulness and patience of the local committee entrusted with the task of finding homes for these people were taxed to the utmost. One of the committee said, "Some agency simply must be found to erect houses and outbuildings on the unoccupied farms if we are to secure settlers for them."

On the Lower Yellowstone project 14 farms having a total area of 1,515 acres have been sold to 15 families. The demand by good tenants for farms on this project was four times what it has been during any of the last five years. The tenants desired to farm a year or two before purchasing. Some wanted to rent with the option of purchase. Those familiar with project conditions state that practically every livable house is occupied. The need of this project is some plan that will provide comfortable houses at modest cost and stables to shelter the livestock on all farms that are for sale or lease.

On the Malta and Chinook divisions of the Milk River project the same conditions are found. At Chinook two business men purchased 160 acres of sagebrush

land, erected two small houses and one small barn at a cost of \$800, and assisted two new settlers to clear the land and get in their crops this year. The result is 25 acres of sugar beets and 130 acres of flax are growing in place of the sagebrush. This change of converting unimproved land to cultivated land has taken place in six months. The two settlers are satisfied and have agreed to each buy 80 acres and pay for the improvements and land under a contract based on crop returns.

Those giving their time and attention to securing settlers for the Malta and Chinook divisions of the Milk River project state they are in contact with a considerable number of settlers of experience and industry who are looking for improved farms which they can buy on long terms. This will permit the settler to put his money and time into growing crops. No time will be lost in making the farms profitable.

The need for these improvements is so urgent that the Commissioner of Reclamation has sent to the projects mentioned a circular and form to be sent out to all landowners who desire to sell their farms. The following is a copy of the circular and form:

UNITED STATES DEPARTMENT OF THE INTERIOR,  
BUREAU OF RECLAMATION,  
Washington, June 6, 1927.

To landowners of Belle Fourche, Lower Yellowstone, and Milk River projects:

During the fall of 1926 and this spring practically all uncultivated farms on the

Belle Fourche, Lower Yellowstone, and Malta division of Milk River projects having houses and other suitable out-buildings were either leased or sold. What settlers especially sought were farms with houses on them to shelter their families and stables to shelter their livestock. There were more settlers seeking these developed farms than could be accommodated. At the same time farms with equally good soil but with no buildings remained untaken because it meant that the settler would either have to put his family in a tent with its discomfort and risk of sickness or incur heavy expense in boarding them in town.

It is believed that good farmers can be secured for these unimproved farms if some agency will erect suitable buildings. In some cases existing buildings can be remodeled or repaired to make them habitable. In most cases new buildings are required. These buildings ought to be financed so that their cost can be added to the selling price of the land and repaid with the cost of the farm over a long period with a low rate of interest.

The need of putting this program into effect is imperative. Sale of farms will be slow and selling expenses high unless these improvements are provided.

This improvement ought to be made before next winter in order that the railroads and the Government can advertise it in their efforts to secure settlers who will plant crops in 1928.

A blank is attached to this letter which you are requested to fill in and return to the superintendent of your project. It is hoped you can see your way clear to effect these improvements or if unable to do so yourself that you will cooperate in securing the needed money from some other source.

Very truly yours,

ELWOOD MEAD,  
Commissioner.

#### DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

##### To project superintendents:

I submit the following replies to questions concerning buildings on my farm:

1. Describe buildings on farm.-----
2. If buildings are in poor condition, will you remodel or repair them for a tenant or purchaser on terms proposed in letter accompanying this form? -----
3. If there are no buildings on your farm how much will it cost to provide a small house and barn? -----
4. Will you provide buildings of about that value for a tenant or purchaser? -----
5. If you are unable at present to provide these improvements yourself, would you give a first mortgage on the farm as security if the money required can be secured from the Federal Land Bank, repayable in 20 years with interest at not to exceed 5½ per cent? -----

Remarks: -----

(Name)

(Address)

When the replies to these questionnaires are received the results will be published in the Reclamation Era. It is hoped that this will give information which will permit some plan to be formulated which will provide these necessary improvements.

## Contracts with Landowners on Vale and Owyhee Projects

IN the effort to have the land of the Vale and Owyhee projects, Oregon, disposed of to settlers on its unimproved value the landowners of these two projects are being asked to sign two classes of individual contracts. One contract, called the incremented value contract, binds the landowner signing it to divide with the project any amount for which his land may be sold in excess of the value arrived at by independent appraisal. One-half of the amount of the sale in excess of the appraised value must be turned over to the irrigation district to apply as a credit on the purchaser's irrigation charges. Any improvements on the land at the time of the appraisal are valued and added to the selling price of the land. Provision is made also that improvements which shall be effected in the future shall be appraised and likewise added to the selling price of the farm.

The other form of contract has for its object the subdivision and sale of land

held in large ownerships, which in this connection means the ownership by one person or corporation of more than 160 acres. Such large landowners are by the contract obligated to select from their holdings the portion which they wish to retain (not exceeding 160 acres) and the remainder they are to dispose of at the prices stated in the contract.

When these contracts were first prepared it was believed that landowners would subdivide the land themselves and secure their own buyers. The owners of the larger tracts of land were reluctant to sign the contracts because they thought the selling costs, including advertising, would leave them very little for the land. This is generally true. If each owner is left to secure his own buyers a great deal of waste in time and money would result.

To overcome this and to provide a coordinated plan of settlement, the contracts were amended to give authority to the Secretary of the Interior to sell any of the

land in question at the prices fixed. In other words, the Government could act as the settlement agency. The following article is incorporated in the contract to provide for this:

It is further agreed that the Secretary of the Interior and his successors in office shall be, and hereby are, duly authorized and empowered by power of attorney, irrevocable, to sell at the prices above specified any part of the above-described excess lands, legal and equitable title to which shall one year after the date of the notice from the Secretary of the Interior that water is ready for delivery to such land stand in the name of the landowner, and the said landowner, for itself, its successors and assigns, does by this agreement make, constitute, and appoint the Secretary of the Interior and his successors in office its lawful attorney, effective one year after the date of said notice, to sell and transfer any or all of the above-described lands to whom the Secretary of the Interior may deem best and on the terms and conditions herein defined, and at the appraised prices aforesaid, giving and granting unto the Secretary of the

Interior full power and authority to do and perform all and every act and thing whatsoever requisite and necessary to be done in the sale of said lands as fully and to all intents and purposes as the landowner may do, to effect full compliance with the terms of this agreement, this

power, once becoming effective, being irrevocable.

With this article included in the contract, the two large owners of excess land on the Vale and Owyhee projects, namely, the Eastern Oregon Land Co. and the

Oregon Western Colonization Co., owners of about 30,000 acres, have each agreed to sign the contract. Indications are that all the owners of excess lands will sign.

## Economic Data Needed from Southern Farms

In connection with the preliminary investigation now being made of opportunities for planned group settlement in the Southern States on projects designated for study by the respective State officials of North and South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee, certain economic data are essential in order to plan to best advantage further investigations and conferences looking to a definite plan for carrying on the proposed organized community development.

The investigations thus far carried out on the seven tracts of land have sought to ascertain what were their agricultural possibilities if subdivided into farms suited to the efforts of the owners and their families and improved so as to be cultivated in accordance with plans recommended by the State agricultural experts, the settlers to be selected and organized as a community group and to have the benefit of competent and experienced leadership.

The areas submitted by the several States fall into two groups—one, farms like those offered in North and South Carolina, Georgia, and Alabama, where part of the area is not cultivated and where farming methods have tended to deplete the fertility of the soil. The other group includes Mississippi, Tennessee, and Florida, where there is now little or no agriculture and where drainage, land clearing, or other reclamation work is needed before settlement can begin. On all these areas, without some outside stimulus such as is afforded by the bureau's plans, settlement must come from a slow infiltration of people from the surrounding area, and the agriculture and farming methods would be much the same as those of the adjacent cultivated areas.

It is necessary, therefore, to show clearly the benefits which would come to these tracts through the introduction of different crops, better methods of tillage, a rural organization for teamwork in business, especially in the cooperative marketing of their products, and the influence which the example of these planned settlements will exert on the State as a whole. With this idea in mind the following census schedule has been prepared in order to obtain economic data which will give a complete picture of what now

exists. This schedule will be used in obtaining the desired information concerning farms on the projects in South Carolina, Georgia, and Alabama.

### UNITED STATES DEPARTMENT OF THE INTERIOR

#### BUREAU OF RECLAMATION

Data concerning farms cultivated in 1926

----- Project.

Farm No. -----

(Locate farm by number on map.)

## Economic Notes from Belle Fourche Project

Otto C. Batch, associate reclamation economist on the Belle Fourche project, South Dakota, makes the following report of economic progress on the project:

A movement has been started to have building sets erected on land available for settlement, but without improvements.

A local committee has been formed to handle livestock loans through the Minneapolis Agricultural Credit Corporation.

A cow census has been started with a view to the establishment of a cheese industry.

Work has begun on the Newell pickle salting station.

The Belle Fourche sugar factory is making fair headway. The force employed on construction is to be increased to assure completion by beet harvest time.

The following activities are suggested: More extensive fall plowing.

Subdivision, wherever practicable, of the large farms into 80-acre tracts.

Purebred sires should be used exclusively and purebred breeding stock advocated in general.

Proper layout of farm ditches, both permanent as well as field laterals. Farm waste ditches should be required to conform with the contemplated drainage system.

More attention should be given to the plan of the farmstead, both from the standpoint of appearance as well as the economical use of time in handling farm chores.

1. Name and address of farmer -----
2. Was farm operated by owner? -----  
Tenant? -----
3. Was farmer white, Indian, or colored? -----
4. Married or single? -----
5. Number of children -----; ages -----
6. How many children assisted in farm work? -----
7. If other labor was employed, state number -----
8. Monthly wages paid for labor \$ -----  
and total amount for year \$ -----
9. Total acreage of farm -----  
Acreage cultivated -----
10. State why balance of acreage was not cultivated -----
11. How long has it been out of cultivation? -----
12. Acreage in each crop -----
13. Yield per acre of each crop -----
14. Price per bushel, per ton, etc., at which each crop was sold or could have been sold \$ -----
15. Number of horses and mules -----;  
cattle -----; sheep -----; hogs -----;  
chickens -----; turkeys -----;  
other fowls -----; hives of bees -----; other livestock -----
16. List the farming implements and tools, stating in each case whether in good, fair, or poor condition -----  
----- Estimated value, \$ -----
17. Kind of house on farm, giving number of rooms, and present condition, whether good, fair, or poor -----  
----- Estimated value, \$ -----
18. List barns and other outbuildings, stating size and present condition -----  
----- Estimated value, \$ -----
19. If farm is fenced, state kind and amount of fencing and present condition -----  
----- Estimated value, \$ -----
20. How is the domestic water supply obtained? -----
21. State kind and character of roads near farm -----

(Signature of informant)

Date ----- 1927.

The production of fruits and nuts on irrigated land has become an important part of the agriculture of the Western States.

The first cost of a reliable water supply forms a necessary part of an orchard investment, and the annual costs of maintaining a water system and applying water add to the yearly charges of operation.



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



THIS section of the ERA did not appear in the May and June numbers due to my absence. I have just completed a field trip which brought me in contact with many of our project women. They have inquired verbally and by letter as to the absence of this section of interest to project women, which is a stimulus to greater effort in carrying on the work.

What is there to say about our project women? I could write pages and pages about my observations. Their progressiveness, thriftiness, and initiative are truly worthy of praise. They never seem to tire; there is always time to take part in some additional welfare activity or progressive movement. I never saw such interest as is evidenced in organization work. Arduous tasks have been made easy by labor-saving devices, and as a result the farm women are in a position to give time to matters of interest to the community.

It is a delight to hear you tell of your activities in and out of your homes. One group of women told me, "We read everything we can get our hands on, and all of our meetings, held to discuss home or community problems, are well attended."

The home-demonstration agents play a very important part in informing the housewife as to better methods to employ. This service is appreciated and made the most of.



Entrance to Yuma Country Club

### Civic Pride

The Yuma project in Arizona and California boasts of this wonderful drive, lined on both sides with date palms bordering grapefruit orchards, which leads to a country club. The club is not far from the city of Yuma and one passes the Fly

Aviation Field on the left—another boast of Yuma's assets.

At the entrance to the grounds of the club stand two giant cacti so typical of the region and so stately for the purpose. This is where Yuma plays. A very delightful clubhouse affords opportunity for diversions from the cares of everyday life. There are no strangers in this section. Everyone is a booster for the project—you are received with open arms. Their friendliness is contagious, and after you have been there only a very short time you feel thoroughly at home.

What an influence in any community such an attitude by the residents has on newcomers! And, after all, isn't it new settlers we want on the Yuma Mesa? Here is an important part for the project women. Just as you have been "sold" on the project, so can you make the settler feel when he comes to live among you.

### Community Goats Save Children

Milk for the baby, a real problem in rural New Mexico, is being solved by the community goat, which lives where a cow would not, and thus saves many a farm baby. To help get the milk to children most in need of it, the farm women of



Palm-lined highway to Yuma's Country Club



Dona Ana and San Miguel Counties, under the direction of the home-demonstration agents, each procured a flock of county goats which are loaned out to farm families with sick or undernourished children.

One Sunday afternoon the agent of Dona Ana County carried two goats in her car a distance of 50 miles to families whose sick babies were much in need of milk. This method of supplying milk to farm children in a country where it is impractical and often impossible to keep cows is proving very effective and furnishes many touching incidents. One San Miguel County baby girl who was in a critically undernourished condition responded with a gain of 5 pounds in four months, and that in spite of the whooping cough.

## *Yakima Has Set the Pace*

After urging the planting of shade trees and shrubbery on our projects, imagine my delight on visiting the Yakima project when I was informed many new trees have been set out in the city of Yakima and on the farms, and these were very much in evidence everywhere. One thoroughfare, originally laid out by the Northern Pacific Railway 40 years ago, is not only lined on either side with beautiful old trees, but in a center parking has a line of trees. These center trees touch those on either side and the arch effect over the street is truly something to be proud of. This is an example of what shade trees will do for a community.

The residents of Yakima advertise to all, by the appearance of their homes, that they are a home-loving people, and they don't care who knows it.

They have a lovely country club which they take great pride in showing to visitors. The view from the clubhouse alone is worth a trip to see. It has a wonderful setting, and if you keep in mind that nothing can survive very long without the application of water, you thoroughly appreciate the beautiful grounds, including golf links, surrounding the club.

The most impressive agricultural scene, however, on the whole trip was a panoramic view of the Yakima Valley and the surrounding country. From a vantage point the farms below formed checker-board proportions. The water supply, the Yakima River (life's blood to the land) wound gracefully in its course; the distribution system in its miniature appearance forming small veins.

What more human picture could tell the whole story of reclamation—the *veritable Paradise* created out of the desert. Here is a wealth in orchards

seldom seen from one point. The happy homes nestled in shade trees and the farms were adequately protected by windbreaks.

The Yakima is truly a wonderful project, and when you are thrown in personal contact with the people you come to realize why the physical advantages of this great orchard region were so completely taken advantage of and developed.

It was my privilege to meet with some of the farm women here and discuss their community and farm activities. With a tone of pride many claimed being in the pioneering class, having come to the valley before there was even a semblance of a single orchard, and only their vision to create out of the desert what is there to-day.

On the 17th of June reclamation as a Federal activity was 25 years old. Many of our present project farmers can boast of having been with us all these years, and, as a matter of fact, having been on the ground before that time waiting for the Government to take hold. I wish these pioneers would state their stories for others to read—they would be mighty interesting reading. Send them to our superintendent on your project to forward or direct to the bureau at Washington.

## *Saving for a Vacation*

Are you going to have a vacation of some sort this year? You need a change, some fun, some rest, something new to think about, whether you happen to be a high-school student, a happy mother, or the father of a family. Everyone needs a holiday occasionally. Better work as well as better health is a result of even a brief change.

Don't say you haven't time or that you can't be spared. That ancient superstition has been long since exploded by that busiest of indispensable persons—the farmer's wife. Every summer hundreds of farm women now manage to get to mothers' camps for a complete change for a few days, returning to their families refreshed in mind and spirit, full of new ideas and happy recollections.

Don't say you can't afford a vacation. There are all sorts of vacations to be chosen—short ones, long ones, inexpensive ones, elaborate ones. It might be only a week-end trip or one over the Fourth of July or Labor Day. If you can't take a train trip, how about the family car? If you can't go to a hotel, try camping. Decide about what you could afford—if you could, put aside a little bit every week from now until midsummer. A vacation doesn't usually just happen. It has to be planned for and saved for. The sooner

you begin to get ready for it, the more you will have in reserve to spend on pleasant things. Next year's fund can be started as soon as this one is over. That's the better plan, but if you haven't given the matter much thought before, do the best you can from now on.

Suppose, for example, you have your eyes on a two weeks' vacation in late August, to cost about \$40—although lots of people would manage to have a fine time for a good deal less money. We'll suppose you need railroad fare as well as board money.

The next point is, of course, can you save that much? A few cents here and there—a little self-denial in small ways—perhaps going without something you would otherwise like to have—and the sum begins to grow. You have to make a choice almost daily. "Shall I have a soda, or put that much aside toward my weekly savings? Do I need new shoes, or shall I wear the old ones a little longer and be sure of my holiday?" If you are a home maker, you may be asking yourself, "Could I make some of the children's clothes and save a few dollars?" Or, "Are there ways in which I can buy the necessary supplies any cheaper?" Perhaps you could find ways to earn a bit here and there, too, to add to your funds, if you see no way to subtract anything from what you already have.

You are doing the best you can during these next few weeks. Suppose you are not able to put by as much as you had hoped before August. The only thing possible is to make your vacation plan fit what you have. You will find some pleasant way to take a vacation if you get yourself in a holiday frame of mind. Then, say to yourself, "Next year I shall be ready. I'll begin by deciding how much a really fine vacation should cost, and then save up for 50 weeks for it."

You can daydream on this practical basis for a whole year, whether you have fixed as your goal an inexpensive visit or a trip that takes you half across the continent. It isn't quite enough, however, to think only about the holiday savings. You have to think of them in relation to all your other expenditures. This means making a plan to cover everything you need, and then watching it to catch the odd pennies for the savings fund.

If you are the head of the family, you will have to include the entire family in your plans, fix on a larger sum, and get everybody to cooperate. It works out the same way as for an individual. If you have never lived by a budget, don't wait until the 1st of January to make one. You can begin any time.



# Lamb Feeding Demonstration on the Uncompahgre Project, Colorado

Conducted by the extension service of the Colorado Agricultural College, under the direction of George E. Morton, head of the animal husbandry department; B. W. Fairbanks, livestock specialist; and R. H. Tucker, county extension agent

**A** DEMONSTRATION on lamb feeding, conducted by the extension service of the Colorado Agricultural College, began on the Uncompahgre project, Colorado, on November 23, 1926, and continued until March 10, 1927, when a "feeder's day" was held for the benefit of all project farmers, and explanatory talks were given by the men conducting the experiment, which was of vital interest to many farmers on the project interested in lamb feeding and its place in the agricultural program. A summary of the objects of the demonstration, rations fed, methods, and results obtained follows.

## OBJECTS OF DEMONSTRATION

1. To demonstrate lamb fattening in the beet-growing districts of western Colorado.
2. To demonstrate the feeding value of barley and corn with alfalfa hay.
3. To demonstrate the utilization of beet tops when pastured in the field and hauled and fed in dry lot.
4. To demonstrate the feeding value of corn added to a beet-top-alfalfa-hay ration when beet tops are pastured in the field and when they are hauled and fed in dry lot.
5. To demonstrate the value of wet beet pulp added to a beet-top-alfalfa-hay ration.

6. To demonstrate the value of wet pulp added to a corn-alfalfa-hay ration.

7. To demonstrate the value of adding molasses to a corn-wet-beet-pulp-alfalfa-hay ration.

8. To demonstrate the value of the narrow-panel method of feeding.

## LAMBS USED

The lambs were purchased from the Vernal section of Utah. They were typical Utah feeder lambs and were vigorous, thrifty, and in good feeder condition. These lambs were sorted into 10 pens of 50 lambs each, and all lots were uniform in weight and feeding condition when the demonstration started on November 23, 1926.

## RATIONS FED

- Lot 1. Corn, alfalfa hay.  
 Lot 2. Barley, alfalfa hay.  
 Lot 3. Beet tops hauled and fed in dry lot, alfalfa hay.  
 Lot 4. Beet tops pastured in field, alfalfa hay.  
 Lot 5. Beet tops pastured in field, alfalfa hay for 50 days. Corn, alfalfa to finish.  
 Lot 6. Corn, beet tops hauled and fed in dry lot, alfalfa hay.  
 Lot 7. Corn, beet tops pastured in field, alfalfa hay.

Lot 8. West beet pulp, beet tops hauled and fed in dry lot, alfalfa hay.

Lot 9. Corn, wet beet pulp, alfalfa hay.

Lot 10. Corn, wet beet pulp, molasses, alfalfa hay.

## DEMONSTRATIONAL METHODS

Individual weights of the lambs were secured on three consecutive days at beginning and end of the test. Lot weights were taken every 10 days throughout the demonstration. All feed was weighed to the lambs, alfalfa hay being weighed to the individual lots. At the end of the demonstration a weigh back was made on the remaining hay. Beet tops fed have been computed on the basis of the amount yielded by 1 ton of beets. The fields used as beet-top pastures and those from which beet tops were hauled were fenced or staked and the beets produced on each area were weighed.

## SUMMARY

Barley was 98 per cent as efficient as corn in the cost of putting on 100 pounds of gain at present feed prices. However, barley was only 89 per cent as efficient as corn in putting on gains; therefore, the barley lambs required a selling price of 15 cents a hundredweight greater than corn to break even.

## Western Colorado lamb-feeding demonstration

[61-pound lambs; 50 lambs per lot fed 105 days (Nov. 23, 1926, to Mar. 8, 1927). Table based on one average lamb]

Lot number.....	1	2	3	4	5	6	7	8	9	10
Ration fed (alfalfa hay self fed in all lots).....	Corn	Barley	Beet tops, hauled	Beet tops, pastured	Beet tops, pastured, corn to finish	Corn, beet tops, hauled	Corn, beet tops, pastured	Wet beet pulp, beet tops, hauled	Corn, wet beet pulp	Corn, wet beet pulp, molasses
Initial weight.....pounds.....	60.9	60.4	61.3	61.7	61.1	61.4	61.3	60.9	60.8	61.1
Final weight.....do.....	91.7	87.8	82.6	83.4	86.2	95.2	95.3	84.2	92.9	93.7
Total gain.....do.....	30.8	27.4	21.3	21.7	25.1	33.8	34.0	23.3	32.1	32.6
Average daily gain.....do.....	.29	.26	.20	.21	.24	.32	.32	.22	.31	.31
Estimated shrink to market at 4 per cent.....do.....	3.7	3.5	3.3	3.3	3.5	3.8	3.8	3.4	3.7	3.8
Estimated gain at market.....do.....	27.1	23.9	18.0	18.4	21.6	30.0	30.2	19.9	28.4	28.8
Daily feed fed (pounds):										
Corn.....	.91				.83	.80	.82		.81	.80
Barley.....		.90								
Tops (from ton of beets).....			.0073	.0100	.0107	.0048	.0078	.0054		
Wet pulp.....								3.61	3.43	2.99
Molasses.....										.38
Alfalfa.....	2.20	2.26	1.46	1.37	1.75	1.35	1.14	1.40	1.47	1.41
Feed required per 100 pounds gain:										
Corn.....	352.6				211.3	280.0	285.1		299.4	291.7
Barley.....		395.4								
Tops (from ton of beets).....			4.26	5.71	2.48	1.68	2.71	2.85		
Wet pulp.....								1,904.8	1,268.1	1,090.1
Molasses.....										138.5
Alfalfa.....	852.4	992.9	851.7	781.8	850.7	472.5	396.4	738.7	543.5	514.1
Feed cost per 100 pounds gain.....	\$8.73	\$8.91	\$4.69	\$5.20	\$7.49	\$7.16	\$7.52	\$5.45	\$8.07	\$8.38
Initial cost of lamb (\$12.73 cwt.).....	\$7.75	\$7.69	\$7.80	\$7.85	\$7.78	\$7.82	\$7.80	\$7.75	\$7.74	\$7.78
Cost of feed.....	\$2.37	\$2.13	\$0.84	\$0.96	\$1.62	\$2.15	\$2.28	\$1.08	\$2.29	\$2.41
Interest on investment, lambs and feed, 8 per cent.....	\$0.27	\$0.26	\$0.23	\$0.23	\$0.25	\$0.27	\$0.27	\$0.24	\$0.27	\$0.27
Estimated shipping and selling expense.....	\$0.63	\$0.60	\$0.56	\$0.57	\$0.59	\$0.65	\$0.65	\$0.57	\$0.63	\$0.64
Total cost per lamb at market.....	\$11.02	\$10.68	\$9.43	\$9.61	\$10.24	\$10.89	\$11.00	\$9.64	\$10.93	\$11.10
Estimated weight at market.....pounds.....	88.0	84.3	79.3	80.1	82.7	91.4	91.5	80.8	89.2	89.9
Necessary selling price to break even.....	\$12.52	\$12.67	\$11.89	\$12.00	\$12.38	\$11.91	\$12.02	\$11.93	\$12.25	\$12.35

Feed costs: Corn, \$35 per ton; barley, \$30 per ton; beet tops, \$0.50 per ton of beets; wet beet pulp, \$1.90 per ton (delivered); molasses, \$10 per ton; alfalfa hay, \$6 per ton.

Lambs made as good gains on beet tops pastured as when the tops were hauled and fed in the lots. In pasturing, more tops and less hay were required to put on 100 pounds of gain than when the tops were hauled and fed in dry lot. In years when hay is high in price this will be an important factor in favor of pasturing the tops, but wet, stormy, fall weather will work to the disadvantage of pasturing. At present feed prices cheaper gains were put on when the tops were hauled to the lots, greater utilization of the tops was obtained, and the necessary selling price to break even was reduced 11 cents per hundredweight.

The tops from 1 ton of beets, when fed with alfalfa, equaled in feeding value 83 pounds of corn. The amount of alfalfa hay required to put on 100 pounds of gain was practically the same in both lots. Therefore, 50 cents' worth of beet tops replaced \$1.45 worth of corn. However, it is doubtful whether the beet-top-alfalfa lambs will be finished enough to sell equal to the corn-alfalfa lambs.

The tops from 1 ton of beets, when fed with corn and alfalfa, replaced 108 pounds of corn and 226 pounds of alfalfa in putting on 100 pounds of gain. At present feed prices the tops from 1 ton of beets have a replacement value of \$2.57. The addition of beet tops to a corn-alfalfa ration increased the gain, reduced the cost of 100 pounds of gain, and reduced the necessary selling price to break even by 61 cents per hundredweight.

Beet tops and alfalfa produced very cheap gains, but this demonstration shows the necessity of adding corn if the lambs are to be finished. The difference in selling price and resulting profits will be shown on the final report sheet, to be compiled after the lambs are marketed.

The addition of wet beet pulp to a corn-alfalfa ration proved very satisfactory, as has been the case always in previous tests with this feed. Wet beet pulp increased the rate of gain, reduced the cost of 100 pounds of gain by 66 cents, and reduced the necessary selling price to break even by 27 cents per hundredweight. Each ton of wet beet pulp fed with corn and alfalfa is equal to 84 pounds of corn and 487 pounds of alfalfa in putting on 100 pounds of gain. At present feed prices 1 ton of wet beet pulp has a replacement value of \$2.93 per ton.

Tests conducted at the State experiment station proved the value of molasses added to a corn-alfalfa ration. At present feed prices its replacement value is \$21.90 per ton. In this demonstration molasses was not a satisfactory addition to a full feed of corn, wet pulp, and alfalfa, as its replacement value was only \$5.66 per ton. This is not an argument against feeding molasses. It merely shows that the molasses did not prove beneficial in this particular combination.

## *Economic Study of Minidoka Project*

**A**N economic study was made recently by John T. Montgomery and James W. Barber of the history, present situation, and outlook of agriculture on the Minidoka project, Idaho. The study was made in partial fulfillment of the requirements for the degree of master of science in agriculture in the department of agricultural economics of the University of Idaho. A review was made of the farm business of 109 representative farms, with respect both to production and to income. The farms were grouped into three classes—one designated as a general farm class, another as a livestock class, and a third as a crops class, depending on the source of the major part of the income. A summary of the study is given as follows:

1. The climate and soil of the area are such that the farmer has quite a range of enterprises to select from.

2. The present population of the project is of an adaptable type.

3. Credit facilities are ample for operating.

4. The weeds, pests, and diseases present in the area do not constitute a very great hazard, as they can practically all be readily controlled. The most outstanding exception is curly top disease of sugar beets.

5. The average size of the farms studied was 86.7 acres. The average investment per farm was \$14,758, of which 82.5 per cent was in land and buildings, 7 per cent in machinery and

implements, and 10.5 per cent in live stock. The average debt was 14.4 per cent of the total investment. An average of 16.6 months of family labor was available.

6. The average receipts from farm products was \$6,339.20, the average expense \$2,104.27, and the average margin of cash receipts over cash expense \$4,234.93. Of the cash receipts 76.1 per cent was from crop sources and 23.9 per cent from livestock sources.

7. Crops are the primary sources of income on the project and livestock enterprises are supplementary.

8. The crops in the order of their estimated five-year margin of cash receipts over cash expenses per acre are potatoes, beans, sugar beets, clover seed, wheat, barley, corn, alfalfa hay, and oats. Livestock listed in the order of their net returns per animal unit are poultry, dairy cows, sheep, and swine.

9. A knowledge of the economics of the different enterprises on the Minidoka project and a knowledge of the best production practices, so that a farm organization that fits the farm and the operator's family might be built up and yields higher than the average of the project might be secured, are essential to success on the Minidoka project.

10. A surplus either in the form of livestock enterprises or cash should be built up during years of high crop prices, so that the farm can finance itself in years of low prices.



A third cutting of alfalfa on the Minidoka project, Idaho

## Contracts With Irrigation Districts, Boise Project

### To Pay Construction Charges On A Crop-return Basis

THE following contracts have been executed on the Boise project with irrigation districts taking over operation and maintenance and receiving the benefits of the act of Congress of December 5, 1924 (43 Stat. 672), by which the water users on the Boise project will be enabled to pay the construction charges on a crop-return basis: Contract with the Nampa and Meridian irrigation district, dated March 2, 1926; contract with Black Canyon irrigation district, dated April 21, 1926; contract with Boise-Kuna irrigation district, dated March 20, 1926; contract with Wilder irrigation district, dated April 6, 1926; and contract with Big Bend irrigation district, dated March 25, 1926.

These contracts follow generally the same pattern, and that with the Nampa and Meridian irrigation district will be described as typical of the whole.

#### THE NAMPA AND MERIDIAN CONTRACT

The Nampa and Meridian irrigation district comprises within its boundaries about 40,000 acres of irrigable lands receiving their entire water supply from the irrigation works constructed by the United States, and about 24,500 acres of old water-right land, of which all but approximately 2,000 acres is irrigated from the Ridenbaugh Canal owned and operated by the district. By contract dated June 1, 1915, and amended November 15, 1918, the district had purchased from the United States water rights for the 40,000 acres of project land at an agreed price of \$70 per acre, payable in 20 annual installments. In the same contracts the district had purchased supplementary stored water rights for the old water-right lands of the district. By previous contracts the district had also taken over the operation and maintenance of the part of the project system within the district.

The act of December 5, 1924, permitted the payment of construction charges on a crop-return basis; that is, the individual water user, instead of paying his proportionate part of the project-construction charges in 20 years as required by the act of Congress of August 13, 1914 (36 Stat. 686), was to be permitted to make payment of the construction charge in an indeterminate period of years, depending upon the crop returns from the land, as ascertained by the Secretary of the Interior. Each year 5 per cent of the gross crop return is payable to the United States. Subdivisions (a), (b), and (c) of article 5 of the contract are quoted in

full, so as to show in detail the method fixed for the payment of the construction charges on a crop-return basis.

#### CONSTRUCTION PAYMENTS 5 PER CENT AVERAGE GROSS ACRE INCOME

(a) The installment of the construction charge per irrigable acre of project lands in the district payable each year shall be 5 per cent of the average gross annual acre income (as determined by the Secretary) for the 10 calendar years first preceding the year in which such installment comes due of the area of project land in cultivation in the district as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive.

#### DISTRICT LANDS AVERAGE GROSS ACRE INCOME

(b) The Secretary will determine the average gross acre income from said lands for the 10 years preceding the year 1925, and will notify the district of his findings thereon, and of the charge per irrigable acre based on 5 per cent of the said average gross acre income, and it is agreed that the annual construction installments for the project lands of the district shall be on the basis of the said rate per irrigable acre as determined by the Secretary multiplied by the number of irrigable acres as said irrigable acreage is shown on the official farm unit plats on the Boise project, until modified by notice from the Secretary of his findings in regard to average gross acre income for said project lands of the district during future years, and the district will pay each year to the United States (in addition to the payments provided for in article 11 hereof) as the construction charge on account of the said project lands of the district a sum determined by multiplying the rate per acre determined in the manner stated above by the total number of irrigable acres of project lands in the district (except lands described in article 11 hereof), which charges shall be assessed

accordingly by the district to the project lands therein. Said annual payments shall continue until the full construction charge of \$70 per irrigable acre of project lands in the district, plus any amounts added thereto on account of interest or penalties and any amounts added thereto under subsection L of section 4 of said act of December 5, 1924, on account of any due and unpaid construction or operation and maintenance charges added to the total obligation as provided in said subsection and other items provided for under articles 9 and 10 hereof have been fully paid by the district to the United States.

#### FUTURE ANNOUNCEMENTS AFFECTING CONSTRUCTION PAYMENTS.

(c) After the close of each year hereafter the Secretary will notify the district in writing of his findings in regard to the average gross acre income for the project lands of the district for that year, and the average for the 10-year period including such year and the nine preceding years unless the Secretary shall find the average gross acre income for such year to be so near the average last determined as to make no material difference in the rate previously determined, in which event the rate last determined and stated by the Secretary shall continue. The failure of the Secretary to state his findings in regard to the average gross acre income for any future year will be construed as equivalent to a finding by the Secretary that the average gross acre income for such year is the same as the average of the last preceding 10 years and that the rate last stated will continue.

The contract authorizes the delinquent charges, the operation and maintenance charges for the current year, and the cost of operation and maintenance equipment transferred to the district to be added to the construction charge and paid as a part of same. Any landowner objecting to the change in terms of payment is to be permitted to remain subject to the old terms of payment.

An important part of this contract is that constituting and dealing with the board of control. It was necessary for the districts operating on the Boise project to set up some sort of machinery by which they could jointly manage certain project facilities serving more than one district. For this purpose the district contracts provide in considerable detail for a board of control comprised of representatives from the various districts.

The profits from an irrigated orchard are dependent upon a uniform distribution of water over the surface and a proper control of the soil moisture within the root zone of the trees.

### International Water Group Adopts New Title

A joint resolution passed at the last session of Congress and approved March 3, 1927, increased the scope of the Commission on the Equitable Use of the Waters of the Lower Rio Grande to include the problems of the Colorado and the Tia Juana Rivers. The personnel of this commission is made up of Dr. Elwood Mead, chairman; Gen. Lansing H. Beach, of California, and W. E. Anderson, of Texas, commissioners, and M. A. Schnurr, secretary.

In view of this fact, the title "International Water Commission, United States and Mexico," has been substituted for the title heretofore used.

## Reclamation Report for May, 1927

*Work in progress.*—The contractors at Stony Gorge Dam, Orland project, made fair progress on excavation during May, and the screening and mixing plant had been practically completed and ready for making concrete. The total amount of excavation done to the end of the month was estimated at 14,042 cubic yards of solid rock and 9,240 cubic yards of earth and loose rock. The Lynch-Cannon Engineering Co. continued work on the bridge over the American Falls Dam and made fair progress. Approximately 330 cubic yards of concrete, 64,000 pounds of reinforcing steel, and 43,000 pounds of structural steel were placed. At Gibson Dam, Sun River project, 11,000 cubic yards of earth and loose rock and 2,000 cubic yards of solid rock were excavated from the north abutment. Work on the spillway tunnel was continued with two shifts, the tunnel being driven about 65 linear feet. At Guernsey Dam, North Platte project, work on the gate and gate hoists was practically completed. All work on the concrete plugs in the diversion tunnel was also completed. At the end of the month the dam was 97.5 per cent completed on the basis of gross earnings. Work on the first division of the main canal, Kittitas division of the Yakima project, was continued by the General Construction Co. and the contract was about 54 per cent completed at the end of the month.

*Weather.*—Cold and stormy weather on practically all of the projects retarded planting and crop growth.

*Settlement and development.*—On May 11 public notice was issued opening to entry

54 public-land farm units on the Willwood division of the Shoshone project. Many inquiries concerning this opportunity are being received and it is anticipated that the units will all be entered shortly.

### Reclamation Bureau 25 Years Old June 17, 1927

*As this issue of the NEW RECLAMATION ERA goes to press, the Bureau of Reclamation is quietly celebrating its twenty-fifth anniversary. On June 17, 1902, the reclamation act under which the bureau functions was approved by President Roosevelt. Many amendments to the original act have since been made, the later ones having to do mainly with the improvements of opportunities for success by the settlers, chief of which are the fact-finders act of December 5, 1924, and the adjustment act of May 25, 1926. Legislation has also been adopted providing for the direction of settlers in working out their agricultural programs. The next step is the adoption of legislation providing for financial aid to settlers in the early years of changing raw land into a producing farm. Such legislation must follow if the United States is to keep pace with the more advanced thought of foreign nations toward reclamation and successful agricultural development.*

During the month 11 additional entrymen, making a total of 82, had been awarded farm units and filed water-right applications on the Tule Lake division, Klamath project. In addition about eight applications were on file with the examining board at the close of the month. The Belle Fourche project reported that the general optimistic attitude in that section and the publicity regarding agricultural opportunities on the project had resulted in continued inquiries concerning the project and an increase in the number of sales. Two farms were sold during the month—one at \$3,200 and one at \$10,000.

### Irrigation in the Madras Presidency

The importance of irrigation in south India may be seen from the fact that the value of the crops raised on irrigated land in the Madras Presidency during the year ended March 31, 1926, is estimated at about \$200,000,000.

The Madras consular district may be compared with Texas as to area, and the area of the Madras Presidency—which comprises about 53 per cent of the total of the district, may be compared with the area of Montana.

In the official year ended March 31, 1926, the area of land under the chief food grains and industrial crops, both irrigated and dry, was 38,788,496 acres, an area about equal to the State of Georgia. Of this area, 7,412,879 acres, or 19.11 per cent of the total cropped area, was irrigated, the land under irrigation being comparable in area to the State of Maryland.

### Grand Valley Potatoes Make Excellent Yield

Mrs. O. B. Garth, Loma, Colo., has very kindly sent in the accompanying illustration and writes as follows:

"EDITOR NEW RECLAMATION ERA,  
"Washington, D. C.

"Inclosed is a picture of the corners of a potato and bean patch. The potatoes, in bloom when taken, yielded 250 sacks to the acre in a 20-acre field belonging to J. W. Klein, Grand Valley project. This was formerly desert land and, under the irrigation project as seen here, was made to blossom as the rose.

"I would like to state we certainly enjoy the ERA and are taking one of the reading courses mentioned last year."



Potatoes and beans. Grand Valley project, Colo.



## Facts About the Strawberry Valley Reclamation Project, Utah

*Here the real homeseeker is welcome and bidden to join in making this region a haven of contentment and plenty—The project described by an enthusiastic supporter of irrigated agriculture*

*By W. H. Olin, supervisor of agriculture, Denver & Rio Grande Western Railroad Co.*

**T**HE Strawberry Valley project lies within the fertile Utah Valley, stretching south from Provo, and skirts the shores of Utah Lake—the largest body of fresh water in all Utah. Strawberry Valley is the one Federal reclamation project lying within the Beehive State.

The water for the lands under this project are brought from the Strawberry Reservoir. This reservoir lies on the extreme west side of the Uintah Basin. It covers 8,000 acres and impounds 250,000 acre-feet of water. This water was first used for irrigation in 1915.

### STRAWBERRY TUNNEL

The waters from Strawberry Reservoir are brought to the Utah Valley lands through a cement-lined tunnel  $6\frac{1}{2}$  by 7 feet, cut through the Wasatch Mountains. This tunnel lies 7,500 feet above sea level and is 19,000 feet long (3.6 miles). It has a capacity of 500 second-feet.

### POWER DEVELOPMENT

The lands irrigated by the waters brought through the Wasatch Range by Strawberry Tunnel lie at an elevation between 4,500 and 4,800 feet. This gives a sufficient fall to generate power of

considerable commercial value. Near the mouth of Spanish Fork Canyon, on the river of the same name, east of the town of Spanish Fork, is the hydroelectric power plant, which is a model of modern electrical construction. The present power developed and put to commercial use is 1,200 horsepower, with much greater development possible as needs shall be manifested. The power plant is operated by the United States and the income thus obtained helps to cut down water costs on the project. To protect the watershed, the project acquired a considerable area of land around the Strawberry Reservoir when the ground was purchased on which to store the water. The income now amounts to more than \$10,000 per year for the grazing rental on the lands adjacent to the reservoir, now owned by the project.

Operation of the Strawberry Valley project passed from the Bureau of Reclamation to the water users' association on December 1, 1926. All water charges have been arranged satisfactorily, and irrigation is considered 100 per cent efficient.

### LAND IRRIGATED UNDER THE PROJECT

The lands now under irrigation are divided into several primary divisions.

- |   |         |
|---|---------|
| (a) Those lands tributary to Payson as a trade center....                                     | 15, 500 |
| (b) Those lands tributary to Spanish Fork as a trade center.....                              | 14, 200 |
| (c) Those lands tributary to Mapleton and Springville as trade centers.....                   | 4, 500  |
| (d) Those lands reaching south through Santaquin and west and northwest toward Utah Lake..... | 4, 000  |

Total acreage under Strawberry project..... 38, 200

This is the area of land either already in crop or for which water is available, with cement-lined laterals provided for water distribution.

### SANTAQUIN DISTRICT LANDS

The writer wishes to call attention to the 4,000 acres of irrigated land not now under crop awaiting the coming of additional farmers to crop the land this next crop season, 1927. Here, in the southern end of Strawberry Valley project, a 40-acre farm is ample for the average man to farm. Here, then, in most desirable environment, is a prospective farm home for 100 families.

### CLIMATIC ENVIRONMENT

Because of the altitude the maximum temperature of summer is not oppressive. The country does not have a dreary rainy season. The summers are long, averaging better than 200 days of growing weather. The evenings are always cool. The thermometer seldom reaches zero in winter and remains at that low temperature for only a few days at a time. The mountains on all sides protect Utah Valley from severe storms. Plowing is often begun in February and crops are well advanced when the early rains arrive. There are hardly any rains from June to September. Irrigation supplies the needed moisture for normal plant growth.

### PROJECT SOILS

There are two general types of soils. The lower valley soils, lying below Spanish Fork, Salem, and Payson, are of a black sandy loam, extending down from 5 to 15 feet; under this is a stratum of coarse sand and gravel through which



Part of the highly cultivated land on the Strawberry Valley project, Utah



percolates pure fresh water. These low-land soils are quite fertile and retain moisture remarkably well. The higher or mesa land soils have a sandy clay loam texture with some fine gravel intermixed. On these soils are found the larger bodies of orchard fruits in Utah Valley.

#### CROPS GROWN

What are the crops of this project?

1. The foundation crop, for farm success, is alfalfa. Three and generally four cuttings are obtained per season, with a season's yield of 3 to 6 tons per acre.

2. Sugar beets we shall name as the second most important crop. Lorenzo Jewett, of the Santaquin section of the project, in 1925 was the champion grower of the whole Utah Valley region, averaging 24 tons per acre yield. The yield of beets runs from 10 to 20 tons, one year with another. Near-by dumps on the Orem Interurban Line and branch lines of both Union Pacific and Denver & Rio Grande Western Railroads insure a market for these beets at one of the four sugar mills within Utah Valley.

3. Early potatoes form a dependable crop, with yields ranging from 200 to 400 bushels per acre.

#### 4. Canning crops.—

(a) Tomatoes, 10 to 12 tons per acre. Specially good tomato growers have made 20 tons in a single season.

(b) Peas, 2,500 to 3,000 pounds per acre.

(c) Beans, 1,500 to 2,000 pounds per acre.

Sweet corn, cucumbers, cauliflower, cabbage, and other truck crops can be produced of most excellent quality and in satisfactory tonnage per acre yields.

5. *Strawberries*.—Farmer Francom, near Payson, has proven this crop can be grown with profit and of unexcelled quality. "Francom's famous watermelons," grown by this truck farmer, are known for their excellence all over Utah. What one man can do another can at least attempt to do.

6. Celery is now a commercial crop on this project. It has a superior quality that is calling attention to this truck crop which has real promise. This is a crop that calls for a special truck experience, for it is our most expensive crop to grow.

7. Wheat, oats, barley, and rye are grain crops that do mighty well on the lands of the Strawberry project. Both yield and quality are surprisingly good.

8. Both bush and tree fruits are grown with commercial success on these lands. Apples, peaches, pears, plums, and sweet cherries are found in commercial orchards. Raspberries, dewberries, blackberries, gooseberries, and currants are all a com-

mercial success in this district. Table grapes of all commercial types from Concord to Tokays can here be grown.

### Salt River Project Power Development

*The following is from the recent annual report of F. A. Reid, president of the Salt River Valley Water Users' Association, Salt River project, Arizona:*

*"The Horse Mesa development is now nearing completion and is in operation earning a substantial profit for our farms each day. The gross revenue of this new development for the month of April exceeded \$80,000, or nearly \$50,000 net profit above interest, depreciation, and operation and maintenance. On April 28 the power system showed 745,100 kilowatt-hours generated during the 24 hours. Previous to the starting of the Horse Mesa plant the highest day's output for April was 395,460 kilowatt-hours or but little over half the present. As you have often been heretofore advised, the Horse Mesa development when entirely completed will more than double the output of your entire system. By the end of this month the Horse Mesa development will be earning over \$4,000 per day, and, with the exception of some unforeseen delay or minor item, will be entirely completed and paying dividends in the form of reduced water assessments."*

#### DAIRY, POULTRY, AND BEE INDUSTRIES

In this "land of plenty" the dairy cow, laying hen and busy bee are very much at home. The Provo district is the Jersey center of the Intermountain West. Within Utah Valley some most promising herds of Holstein and Guernsey cattle are also found. The Utah Poultry Association is one of the very best managed and most successful poultry associations in all this great Nation of ours. Everyone who sells his eggs and his poultry meats through this association automatically becomes a member of the association. Organized in 1922 it now sends to market 300 or more cars of eggs, with a net return to the grower of more than 30 cents per dozen the year round. The Utah Honey Producers' Association is likewise active in grading and marketing Utah honey in car lots at advantageous prices.

Here is a homeland known for its good schools and churches; its people, who work for present good and future prosperity; a region where community life is most ennobling and inviting; where the boy and girl club work, home demonstration and county agent workers are gradually raising country life standards; where the free rural delivery, the telephone, the radio, and hard-surfaced roads, with the auto, are eliminating distance and bringing the country and town into interdependent relationship. Truly, can we say, "Here the real home seeker is indeed welcome and bidden to join in making this region a haven of contentment and plenty."



Three-year old grapefruit orchard on Yuma Mesa

## Organization Activities and Project Visitors

CHIEF Engineer Walter made a recent trip over the Colorado River drainage, visiting Glen Canyon, Boulder Canyon, Bullshead, Mohave, and Parker Reservoir sites in company with the special advisers appointed by Secretary Work to investigate the possibilities of the development of the Colorado River. Mr. Walter was in the Washington office the latter part of June to assist on the Budget.

Mary E. Walsh, formerly employed in the United States land office at Vale, Oreg., has been transferred to the Vale project as assistant clerk.

Allan Johannessen, transitman, has been transferred from the American Falls Reservoir to the Owyhee project.

L. M. Lawson, project superintendent of the Rio Grande project, New Mexico-Texas, has been appointed commissioner (American section) of the International Boundary Commission, United States and Mexico, to succeed George Curry, former Governor of New Mexico.

Mr. and Mrs. Hiram N. Savage were recent visitors to the Washington office.

General Foreman John Young, who has been in charge of the power distribution system on the Shoshone project since its inception, has resigned because of ill health and is going to southern California. Adrian Sowards, powerhouse foreman, has been placed in charge of the entire power system and Loyd H. Lasher has been appointed powerhouse foreman.

Julian Alcola Buendia and Procopio F. Eleazor, natives of the Philippine Islands, visited several of the reclamation projects and were later given temporary employment on the Kittitas division of the Yakima project.

Dr. Kanichi Kachi, of the Ministry of Agriculture and Forestry, section of land adjustment and reclamation, Tokyo, Japan, visited the Denver office to inspect plans for irrigation structures. Doctor Kachi was also a visitor at the Orland, Yuma, and Rio Grande projects, and the Washington office.

Mr. Gunjiro Takei, civil engineer, Government General of Chosen, Japan, was in the Denver office recently to study high-pressure outlet structures and valves.

William S. Arthur, for many years an employee of the Bureau of Reclamation, his last assignment being as chief clerk and superintendent of the Williston project, North Dakota, died suddenly in El Paso, Tex., on May 9 from acute peritonitis.

Assistant Engineer Peter Vier has been reinstated in the designing section of the Denver office.

William C. Matthews, special assistant to the Attorney General, spent two days recently on the Orland project in connection with the Stony Creek water right adjudication suit.

H. S. Diesem, of the Wichita Land Bank, spent several days on the Uncompahgre project, making an examination of the project and bringing up to date previous reports in connection with information desired by the bank prior to making loans on the project under the amortization plan.

L. N. McClellan, electrical engineer from the Denver office, and B. E. Stoutemeyer, district counsel, visited the Boise project recently and inspected the Black Canyon plant.

Among recent visitors to the American Falls Dam, Minidoka project, were G. E. Waesche, engineer for Sanderson & Porter, of New York, who made some investigations for a dam at that point in 1910; Gov. H. C. Baldrige, of Idaho, and John Welch, commissioner of agriculture; and Horace Addis, editor of the Idaho Farmer.

W. L. Lawson, formerly general manager of the Great Western Sugar Co., spent a day on the Sun River project to ascertain what the conditions are for sugar-beet culture.

Word has reached the Washington office of the death on June 21 of Clyde C. Dawson, former member of Secretary Work's Fact-Finding Commission.

A. N. Burch, engineer, has been appointed to take charge of Truckee and Carson River storage investigations, with headquarters at Reno.

E. B. Debler, hydrographic engineer from the Denver office; A. N. Burch, engineer; and A. W. Walker, superintendent of the Newlands project, have made a preliminary examination of the drainage problem in the Truckee Meadows and possible reservoir sites on Prosser Creek and Little Truckee.

E. E. Roddis, district counsel, was on the Lower Yellowstone project for several days in May and June in connection with rights of way and other legal matters.

C. M. Day, engineer from the Denver office, visited the Klamath project recently to conduct tests on the Dry Lake pumping plant.

Otto C. Batch has reported for duty as associate reclamation economist on the Belle Fourche project, S. Dak.

District Counsel Burke visited the Belle Fourche project recently to consider various legal matters and to meet with the irrigation district board relative to a final draft of the proposed contract.

Harold Prior, transitman, has been transferred from Gibson Dam to the project office of the Sun River project at Fairfield, and the vacancy filled by L. R. Dunkley, formerly employed on the Salt Lake Basin investigations.

Miss Viva Powers Black, underclerk at the Burley office, Minidoka project, has resigned.

Prof. G. R. McDole, soil technologist of the University of Idaho; E. N. Poulson, of the Bureau of Soils, United States Department of Agriculture; and J. A. Thompson, assistant in the soils division, Agricultural College, University of Idaho, made several visits recently to the Minidoka project in connection with a soil survey which may embrace parts of the gravity extension.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schmurr, Secretary to the Commissioner

George C. Kreutzer, Director of Reclamation Economics

P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant

H. A. Brown, Chief of Division of Settlement and Economic Operations

C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wildo Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak.	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise <sup>1</sup>	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodia	J. R. Alexander	Montrose, Colo.
Huntley	Ballantina, Mont.	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill <sup>2</sup>	King Hill, Idaho					
Klamath	Klamath Falls, Oreg.	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savaga, Mont.	H. A. Parker	E. R. Schepplmann	E. R. Schepplmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont.	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka <sup>3</sup>	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands <sup>4</sup>	Fallon, Nev.	A. W. Walker		Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte <sup>5</sup>	Mitchell, Nebr.	H. C. Stetson		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash.	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif.	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg.	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex.	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo.	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River <sup>6</sup>	Phoenix, Ariz.					
Shoshone <sup>7</sup>	Powall, Wyo.	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley <sup>8</sup>	Provo, Utah					
Sun River	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla <sup>9</sup>	Hermiston, Oreg.					
Uncompahgre	Montrose, Colo.	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg.	H. W. Bashora	C. M. Voven	B. E. Stoutemyer	B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash.	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz.	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks <sup>10</sup>	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo.	F. F. Smith <sup>10</sup>		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash.	Walker R. Young <sup>11</sup>	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibbon Dam.	Augusta, Mont.	Ralph Lowry <sup>11</sup>	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault <sup>11</sup>	C. B. Funk		R. J. Coffey	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Ooshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

<sup>10</sup> Resident engineer.

<sup>11</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Albuquerque, N. Mex.	C. C. Elder	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo.	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash.	J. L. Lytel	
Cache la Poudre	Denver, Colo.	Thos. Hawthorne	Poudre Valley Water Conservation Association.
Columbia Basin Project	Lind, Wash.	B. E. Hayden	
Truckee and Carson River	Reno, Nev.	A. N. Burch	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.



PART OF THE EXHIBIT BY THE BUREAU OF RECLAMATION AT THE CONVENTION OF THE AMERICAN MEDICAL ASSOCIATION IN WASHINGTON, D. C., MAY, 1927

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J. Deen  
Ed.

RECLAMATION PROJECT

# NEW RECLAMATION ERA

VOL. 18

AUGUST, 1927

NO. 8



CONCONULLY RESERVOIR, OKANOGAN PROJECT, WASHINGTON



# TEN COMMANDMENTS FOR THE IRRIGATION FARMER



1. THOROUGHLY PREPARE AND SMOOTH THE FIELD TO BE IRRIGATED.  
*This will save labor, water, and time.*
2. CONSTRUCT GOOD DITCHES OF THE PROPER SIZE IN THE RIGHT LOCATION.  
*This will save labor and enable the field to be more thoroughly irrigated.*
3. PLACE GOOD HEADGATES, CHECKGATES, AND TURNOUT BOXES WHERE AND ONLY WHERE THEY ARE PRACTICAL.  
*This reduces labor and waste water during irrigation operations.*
4. MAKE THE "RUNS" OF SUCH LENGTH THAT THE WATER WILL BE MOST ECONOMICALLY USED.  
*"Runs" that are too long cause the water to percolate too deep. "Runs" that are too short do not allow the water to percolate deep enough. Test the depth of moisture percolation by using a soil auger.*
5. KEEP ALL DITCHES AND STRUCTURES IN GOOD REPAIR.  
*This saves water and labor at the time of irrigating.*
6. AFTER THE WATER HAS BEEN APPLIED CULTIVATE THE FIELD.  
*This will sometimes eliminate the necessity of another irrigation. Land that is not cultivated at the proper time will in time lose, by evaporation, all the moisture that has been applied by irrigating.*
7. DO NOT PERMIT THE WATER TO REMAIN STANDING ON THE FIELD FOR SEVERAL HOURS IN SUCCESSION.  
*It harms the crop by scalding it and damages the soil by puddling it.*
8. DO NOT SOAK THE LAND TOO DEEP AT EACH IRRIGATION.  
*This is a waste of time, labor, and water in most cases.*
9. DO NOT WASTE WATER.  
*Some one else will appreciate it. Your waste water will make a crop for some one else.*
10. STUDY THE CROP—STUDY THE FIELD—STUDY THE DIFFERENT WAYS OF IRRIGATING.  
*Each crop in each field is a separate problem.*

—PROFESSOR ALBERT S. CURRY,  
Agricultural Experiment Station,  
New Mexico College of Agriculture and Mechanic Arts

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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No. 8

## *Interesting High Lights on the Reclamation Projects*

**A** MARKETING association for handling poultry products is being organized on the Grand Valley project, with an initial membership controlling 50,000 hens. The organization will include Delta and Montrose Counties.

**G**OOD rock has been found for foundations for practically the whole of Stony Gorge Dam, Orland project—much better than surface appearances indicated at the start. The total amount of excavation to June 30 amounted to 19,537 cubic yards of solid rock and 9,529 cubic yards of earth and loose rock.

**O**N the Klamath project the area planted to potatoes is estimated at 4,000 acres, or a 100 per cent increase over the 1926 acreage.

**S**HEEP shearing on the Klamath project has been completed. The clip for the Klamath country was the largest in years, amounting to about 900,000 pounds, practically all of which has been sold. J. Koshland Co., of Boston, purchased 400,000 pounds.

**D**URING the month of June, 31 entrymen, making a total of 113, had been awarded farm units and filed water-rental applications in the Tule Lake division of the Klamath project. About 10 units remained on which applications had not been filed. More than 70 per cent of the entrymen have started development of their units, and it is estimated that about 2,500 acres of these lands will be cropped or under cultivation this year.

**T**HE Jerome B. Rice Seed Co. is conducting a small experimental plot near Fairview, Lower Yellowstone project, to determine the fitness of the locality to raise canning vegetables, such as corn, beans, tomatoes, cabbage, etc., and particularly to study the depth of planting seed, irrigation, and cultural methods.

**C**HECKING of the records in the office of the attorney for the Vale-Oregon irrigation district on June 30 showed that 6,450 acres had been signed up on the "incremented value" contracts and 2,000 acres on the "excess land" contracts, described in the New Reclamation Era last month.

**T**HE Burley irrigation district, Minidoka project, has been very successful in making collections of construction and operation and maintenance charges. The first half of the 1926 construction charge was paid in full to the Government on December 31, 1926, and the second half on the due date, July 1, 1927, the total payment amounting to \$95,981.78. The original assessment levied amounted to \$118,378.79, of which more than \$101,000 was collected, leaving a balance of about \$5,000 above the amount payable to apply on next year's assessment. The 1927 maintenance assessment has been paid on 47,479 acres out of a total of 47,947 acres assessed, leaving only 468 acres not entitled to water deliveries this season.

**T**HE annual report of the Mini-Cassia Dairyman's Association, Minidoka project, shows a marked growth in business during the year. A total of 352,568 pounds of butterfat was handled at an average price of 43 cents a pound. The association paid out during the year \$151,604.24 in cream checks to the farmers for milk and cream. Expansion of business required additional quarters, which were obtained at the old Burley potato chip mill, which has been remodeled and where railroad trackage is available.

**C**LEAN-UP prices on last year's crop on the Yakima project have been much better since the first of the year than was expected, with the result that the returns from both apples and potatoes held in storage were practically \$1,000,000 more than had been estimated.

**P**LANs are on foot for the establishment of a large chick hatchery at Rupert, Minidoka project. Machinery and equipment for a plant with a capacity for 47,000 eggs are reported to have been ordered.

**T**HE State of Wyoming has begun cooperative advertising for settlers. One prospective settler visited the River-ton project during the month.

**A**T the recent Trans-Continental Highway Exposition at Reno, the Churchill County exhibit, which embraces the Newlands project, received very favorable comment.

**T**URKEY thieves have been active on the Newlands project and it is believed that a well-organized gang with several avenues of disposition of stolen birds is at work. The loss to several growers has been considerable.

**C**ONSIDERABLE interest is being shown by local organizations on the Milk River project in the questionnaire and circular relative to buildings on untenanted farms on the project. A thorough canvass is in progress, and it is expected that a sufficient number of farms will be offered for sale at definite terms to warrant more intensive advertising of the project, with a view to early settlement.

**T**OURISTS from all parts of the country are visiting the Belle Fourche project as part of a trip to the Black Hills, and inquiries are numerous concerning farming opportunities. A representative of the Chicago & North Western Railroad was on the project taking moving pictures of farm scenes as a part of their advertising program.

## Economic Notes from the Projects

### Fixing the Size and Shape of Farms According to Topography<sup>1</sup>

*Subdivision and exchange of land in Badger Pocket, Kittitas Division, Yakima irrigation project, Washington*

*By Walker R. Young, construction engineer, Bureau of Reclamation*

IN Badger Pocket, located at the easterly end of the Kittitas division of the Yakima irrigation project, Washington, there is a compact body of undeveloped land of which the Government, the State, and the Northern Pacific Railway Co., collectively, own about 50 per cent. Within the boundaries are 8,360 acres, of which approximately 6,000 acres lie under the Kittitas canals. According to recent maps, the privately owned lands are held by 24 individuals, but in some cases several tracts are controlled by one person with the result that negotiations in connection with subdivision will probably not involve more than 12 or 15 individual owners.

In general, the land is characterized by rough topography and is covered with sagebrush, so that an unusual opportunity is afforded for the application of a directed plan of settlement in which the size and shape of farms would be fixed in accordance with the topography and productive capacity of the land, keeping in mind, also, the limited capital of some of the prospective settlers.

Badger Pocket is a valley whose axis lies at about 45° with the compass. The bench lands on either side have a slope of approximately 5 feet per 100, but near the creek they are very much steeper. Over most of the area, particularly at the easterly end, side drainage has cut many channels to Badger Creek, resulting in typical "washboard" country with alternating ridges and draws transverse to the axis of the valley. If laterals and roads were constructed on legal subdivision lines, they would cross the ridges and draws, which, of course, is objectionable. It would be unusual to find a ridge or depression in coincidence with a land line as now laid out.

In subdividing an area without regard to legal subdivision lines the main laterals and roads, for obvious reasons, become the natural division lines between farms; and in an unsettled area it is possible to coordinate the layout of farms and roads to fit a lateral system designed to serve the area most efficiently. In this case there are three main laterals circling the valley.

There has been no need for building roads in Badger Pocket with the excep-

tion of a trail paralleling the creek. Advantage can therefore be taken of the opportunity to lay out a road system providing direct routes to shipping points, which, in this case, are the towns of Kittitas, on the Milwaukee Railroad, and Thrall, on the Northern Pacific.

The road system includes a trunk line down the axis of the valley, fed by secondary roads following the side depressions from all parts of the district. Roads were projected to give each farm an outlet to the trunk road, following the easiest grades and most direct practicable route to town.

The area has been divided into 120 farms ranging in size from 17 to 304 acres, the largest containing 197 acres of pasture lying above the highest lateral. Of the 120 farms 9 have less than 20 acres of irrigable land; 20 have between 20 and 30; and 22 between 30 and 40. On the north side of the valley, where the slopes are reasonably uniform, the land is considered adapted to general farming only; consequently farms were made comparatively large, the largest containing 107 irrigable acres. A number of local fruit raisers believe that as the adaptability to fruit raising is demonstrated farms gradually will be subdivided into sizes best suited for that purpose. The distribution system, therefore, has been so planned that little additional expense will be required to provide water for smaller subdivisions. As the more rugged slopes on the south side of the pocket probably will be devoted to fruit culture from the beginning, the farms in that region were made smaller.

Where boundaries between farms were not fixed by laterals or roads they were projected on ridges and in depressions in an effort to avoid the necessity of cutting through farms with laterals, which often results in leaving inaccessible patches of land.

As a result of disregarding legal subdivision lines, a large number of proposed farms include lands held at present by two or more owners. Therefore, in order to carry out the plan, it will be necessary for owners to exchange lands. One proposed farm is made up of public, State, railroad, and privately owned

land. The complications attending the exchange of lands among so many owners will be annoying, but, we hope, not serious.

One complication results from the inclusion within the area of a section of school land granted to the State of Washington by the United States. Section 11 of the act of Congress, relative to the admission of Washington as a State (act of February 22, 1889, 25 Stat. 676) provides, in part: "That all lands herein granted for educational purposes shall be disposed of only at public sale and at a price not less than \$10 per acre." Article 16, section 1, of the Washington State constitution states: "Nor shall any lands which the State holds by grant from the United States \* \* \* be disposed of except in the manner and for at least the price prescribed in the grant thereof, without the consent of the United States."

In order to make exchanges of the State land possible it becomes necessary, first, to secure legislation from Congress permitting the State to dispose of its land in a manner other than by public auction and, second, to secure State legislation providing for such disposal.

During the recent session of the State legislature a bill was passed providing for the subdivision and disposal of State lands on Federal reclamation projects. The act authorizes the subdivision of State lands to conform to the division of farm units provided in the general plan; authorizes the sale of State lands in farm units as laid out; and provides for the exchange of State lands in Federal reclamation projects for public lands of the United States in the same project, or elsewhere in the State of Washington, of approximately equal appraised value, in the event such exchange is authorized by an act of Congress.

If the desired Federal legislation can be secured the problem will be simplified. If found desirable, the State's section 16 within the area selected for trial of the land-settlement plan could then be exchanged for public land either in the Kittitas project or elsewhere within the State; but it may be desirable to retain the State land within the Badger Pocket area, as it will afford an opportunity to demonstrate the practicability of State-cooperation.

<sup>1</sup> Paper read at the Denver conference, March, 1927.

There are no problems connected with the subdivision of railroad lands for the reason that officials of the company are in sympathy with the plan and have offered to cooperate to the extent of exchanging lands.

The practicability of the plan rests largely with the individual land owners. Refusal of one owner to exchange land with his neighbor would cause the plan to be less attractive. So far, three meetings of representative owners have been held to discuss the plan and ways of overcoming the difficulties. Realizing that exchange of their lands must be worked out largely among themselves they requested that a map of the proposed subdivision be made available for their use. The reaction has been favorable, and the situation looks promising for carrying out the plan in its entirety. We have been requested to join the land owners in actually laying out and flagging a portion of the area according to the farmers' point of view. We feel confident that the result will be similar to the projected plan, but the practicability of the layout will be better illustrated if the farmers themselves have a hand in it.

Several methods of handling the exchange of lands have been discussed. The consensus of opinion seems to be that unguided transactions between individual owners would be doomed to failure. It has been suggested that all interested parties pool their lands with a trustee, who would be entrusted with their exchange and sale upon the basis of appraised values. Even though this plan might be acceptable to the United States, the State, and the railroad, it apparently does not appeal to the individual owners, as they insist on making their own deals. In the plan which at present appears to be the most practicable, the trustee would serve only as a medium through whom transactions between individuals would be consummated after they had agreed, in general, upon the terms. In transactions involving public, State, or railroad lands, the sale would be contingent upon the purchaser acquiring the portion of the farm lying on the other side of the legal subdivision line, and final action would be withheld until the purchaser actually had acquired it.

It has been claimed that departure from ordinary legal subdivisions will result in complicated land documents through the introduction of lengthy and involved descriptions of boundaries. A plan has been suggested, however, which promises to simplify transactions. Under this plan, the entire area would be platted, each farm being given a number. The plat would be filed in the county recorder's office and in all future transfers the land would be referred to as a certain tract in plat so and so. In the event the State subdivides its own land, the surveys would be made according to the adopted plan and, to avoid confusion, the tract numbers assigned would be those originally assigned by the Bureau of Reclamation.

Should the plan for Badger Pocket be adopted, an opportunity will be afforded to demonstrate the practicability of subdivision according to topography in a district which is particularly adapted to that method of subdivision. If the details can be worked out successfully, there are approximately 20,000 acres of irrigable land in the eastern end of the project susceptible to similar treatment.

## *Baker Project, Oregon, to Have Economic Examination by Three Special Advisers*

IT has been agreed between the water users of the Baker project, Oregon, and the Secretary of the Interior that three special advisers be appointed to examine the project and make a report as to its feasibility under present conditions.

The secretary has accordingly designated George Severance, professor of agricultural economics, State College of Agriculture, Pullman, Wash.; F. B. Linfield, acting president, Montana Agricultural College, Bozeman, Mont.; and A. J. Wiley, consulting engineer of the Bureau of Reclamation, Boise, Idaho. The first meeting of the special advisers was held in Baker City, Oreg., July 14. The secretary's letter of instructions to each of the special advisers follows:

In accordance with your acceptance of an appointment as a special adviser to examine and report on the economic feasibility of the Baker project, there was sent you on July 2 the following telegram:

"Arrange to meet other members board Baker City July 14. Letter telling of arrangements for travel and compensation follows."

Your willingness to render this public service is appreciated. Arrangements will be made to enable you to make an examination and gather information needed to

give an expert, unbiased opinion as to the economic feasibility of the project.

Your attention is called to the following legislative and economic conditions which have a bearing on this:

1. The cost of these works, if built, must be repaid in forty years, under the present law applicable.
2. The average construction cost will be more than \$150 an acre.
3. There is at present no law, State or Federal, which provides for financial advances to settlers to aid them in improving and equipping farms.

You will seek, therefore, to ascertain what the improvement and equipment of farms on this project will cost, and to reach a conclusion as to whether sufficient settlers having the requisite capital can be secured without undue delay.

Feasibility, in the opinion of this department, depends on:

First. Whether settlers, qualified by experience and capital, can be secured;

Second. Whether in the absence of necessary capital possessed by the settlers, means for developing farms can be provided otherwise, under satisfactory conditions as to time and interest rate; and,

Third. Whether the farm, if properly equipped and improved, will enable irrigators to earn a living, meet taxes and

other charges, and return the cost of these works to the Government in 40 years.

It is the view of the department that the project is not economically feasible under present conditions; that if built the cost will not be repaid to the Government in 40 years, and that it will not furnish satisfactory opportunities for settlers. The advocates of the project urge that it is feasible; that qualified settlers with adequate capital will promptly take up the land and that the cost of the works will be repaid within the contract period.

Your long experience in irrigation development in adjoining States will enable you to decide which of these two views is correct. It is the desire of this department and of Congress to act in accordance with the public interest, and to this end your report will have great value. It is proposed to submit it to Congress for its information and action.

The economic reports and the reports of hearings in Congress during the past two years are being transmitted to you through the chief engineer of the Bureau of Reclamation, who has been asked to be present at your investigations in Baker and render whatever assistance is needed to expedite your work.

## Settlement and Development of Yuma Mesa

**I**N connection with the plans being considered for the settlement and development of the Yuma Mesa, Yuma project, Arizona-California, the following resolution has been adopted by a committee of six chosen from a mass meeting on the project called by the Yuma Chamber of Commerce:

Whereas Unit B of the Yuma Mesa auxiliary project is perhaps the best adapted body of land in our country for citrus and early grape culture, and also especially suited for the growing of early vegetables and melons, as well as all farm products; and

Whereas the United States Reclamation Service has constructed a costly, efficient, and permanent pump water system for 6,000 acres of said land; and

Whereas there are now only 900 acres of land in actual cultivation; and

Whereas the entire tract could be made highly productive and put on a profitable basis and must be brought into cultivation in order to take care of and reduce the present irrigation costs:

Now, therefore, this committee appointed by mass meeting called by the chamber of commerce and Office of United States Reclamation Service respectfully recommend that the United States Reclamation Service, the honorable Commissioner Elwood Mead, the honorable Secretary of Interior Hubert Work, and our representatives in Congress be requested to use every effort to secure an appropriation sufficient to properly clear, level, plant, and place in a state of cultivation each acre of land now owned by the Government in Unit B.

That each 10-acre unit be planted, approximately, 2 acres to citrus, 2 acres to grapes, both intercropped with alfalfa,

the balance to alfalfa, or garden truck and melons, and in some cases date trees.

That same be offered for sale by the Government on an amortized plan covering a period of 20 years or more at a reasonable rate of interest.

That a syndicate or pool plan be worked out for a portion of the lands for such purchasers as do not desire to immediately live on the lands purchased, but who are willing to pay for its early development, in which case 100 to 200 acre tracts could be developed by them much cheaper than as individual units, as one expert could look after 200 acres as well as 10, and there would also be some saving in common labor; this would permit farmers, laborers, as well as salaried people and those desiring to make their future home there, to make their payments from their present income, and they would not have to move on to their tracts until the vines, trees, and crops were advanced to the stage of a paying and self-supporting basis.

We feel that the investor, as well as the actual homeseeker, should be appealed to in the sales literature, as the investors' holdings will mean actual homes in the future, and while the desired result of reclamation—that of immediate homes—is apparently delayed by selling to investors, we believe, if properly handled, the real object will be accomplished as soon, or sooner, by sales to investors as well as to actual homeseekers.

After thorough investigation, we are convinced beyond question of a doubt that alfalfa and all farm products can be grown profitably on this land—especially tomatoes, peppers, asparagus, early melons, peas, cucumbers, and onions—especially after the land has been cropped one year to alfalfa, and that as this warm, frostless belt will produce its crops so much earlier, it will find a market at many times the

normal price, and that these crops have passed the experimental stage, both from the actual growing by those now cultivating the land, as well as the Government and State experiment stations.

We feel that any reclamation project is but half completed when the construction work alone is done, and that it is fully as vital to the success of the problem to see that those who pioneer the early settlement of any project should be selected with care, and finances and payments arranged in order to carry them through the earlier nonsupporting stages until the land is on a paying basis.

We also feel that the present individual owners of Mesa land not now in cultivation should be entitled to have their land also put into a state of cultivation by proper agreement with the Government.

We also feel that the railroad companies will be more than glad to cooperate in any logical advertising plan that may be suggested.

BERT CAUDRY, *Chairman.*  
J. C. BARTER.  
J. W. LONGSTRETH.  
JOSEPH P. COREY.  
J. GUY HAMILTON.  
L. P. HAMILTON.

## Farm Laborers' Capital Reduced

On the Willwood division of the Shoshone project, Idaho, where 54 public-land farm units were opened to entry, recently, are 14 units varying in size from 9 to 9.8 acres, which were provided for homes for farm workers. The division is some distance from Powell or from other permanent source of reliable labor. It was desirable therefore that these units be taken by good farm laborers who would make their main incomes by working for others, but at the same time have a home of their own close to those farmers who employ them. The areas are sufficiently large to grow enough alfalfa to keep a cow and green feeds for chickens and pigs and provide a good garden to supply the farm workers' family with potatoes, root crops, and other vegetables.

The public notice as issued required that each applicant should have at least \$2,000 in money free of liability, or the equivalent thereof in livestock, farming equipment, or other assets deemed by the examining board to be as useful to the applicant as money.

The requirement of \$2,000 was, however, believed to be more than a farm laborer would need to become established, and that \$500 would more nearly meet his needs. The Secretary of the Interior has accordingly amended the public notice to provide "that the applicants for farm units of 9.8 acres or less in area may qualify (if otherwise eligible) with the possession of \$500 in money free of liability or other useful assets."



Barley crop in Yuma Valley, Yuma project, Arizona-California



## Oregon Has Placed 2,600 Settlers During Past Three Years

THE striking results of organized effort in obtaining settlers for unoccupied farm lands in Oregon is told in a recent letter to Commissioner Mead from W. G. Ide, manager of the Oregon State Chamber of Commerce. The work was carried on through the land settlement departments of the Portland and Oregon State Chambers of Commerce, and was financed by the state-wide Oregon development fund, especially raised for this purpose. The work received the active cooperation of the 90 affiliated chambers of commerce throughout the State, the agricultural college at Corvallis, especially through their extension service and county agents, and the officials of irrigation districts.

As a first step in the work a committee of 10 representative business men of Portland met each week to formulate plans. This committee traveled throughout the State, visiting the different chambers of commerce in localities where land settlement was necessary, assisting them to organize land settlement committees and also a separate committee known as an appraisal or approval committee, consisting of nine members—business men, farmers, bankers, and others who knew land values and who had large public interests but no interest in land sales.

This committee of nine was divided into subcommittees of three members each: A listing committee to select lands suitable for families; an approval committee to approve the prices put upon these lands by the owners; and a follow-up or welcoming committee, whose business it was to call upon the new settler, or cause some one to call on him and his family, making them feel at home, getting them acquainted in their locality, and assisting them in community affairs.

The next step was the placing of classified advertisements in selected farm papers in the Middle West, in California, and in some of the Southern States west of the Mississippi River. The result of the first year's advertising was only fair, the inquiries costing about \$1 each. The second year's advertising was better, and the third year was still better, the cost being reduced from \$1 per inquiry to 30 cents per inquiry.

When the inquiries were received each was answered by letter accompanied with a questionnaire designed to obtain information concerning the prospective settler's qualifications and desires in order to aid the committee in helping him to select a suitable location. At the head of the questionnaire was the following statement to the settler:

"We can come nearer to helping you get just the information you want if you

will fill out the following questions and return to us. This information is confidential. We have no land to sell, but we want you to get the facts you need. If there are reasons why you prefer not to fill this out, write anyway. We advise that a part of your money be retained for expenses and equipment, and that a total capital of at least \$2,500 is necessary to make a start."

Then followed space for the settler's name and address and the following questions: In which section of Oregon are you most interested? Would you prefer improved or unimproved land? How large a farm would you like? About how much would you want to invest? Would you be willing to assume some mortgage? Are you farming now? Are you interested in irrigated land? Have you decided to make a trip to Oregon? About what time? What kind of farming interests you most—dairying, sheep, stock raising, poultry, fruit, general farming?

On the back of the questionnaire request was made for the names and addresses or friends of the inquirer who might be interested in the agricultural and industrial opportunities of Oregon.

Several thousand of these questionnaires were returned to the committee, which has a follow-up system extending over a period of a year. Each county in the State, where settlers are desired has been encouraged to print literature describing its own particular advantages, and each week the committee sends to the secretaries of the local chambers of commerce a list of prospective settlers who have

stated in the questionnaire that they have decided to go to Oregon. This method gives every locality in the State a chance to present the opportunities they have to offer, with the result that hundreds of people have practically decided to what section of the State they would come before leaving their homes.

An additional service during the tourist season has been to place representatives at the gateways entering Oregon to interview tourists crossing the line, to learn whether they were prospective settlers and to advise them of what there is to see between the State lines and Portland.

As a result of this work the records of the committee show that 2,600 families have been located in the State, and this number is believed to be not more than half of the actual settlers who have come to the State through this work, but who have not been recorded by the committee. The new settlers have brought about \$12,000,000 of new capital into the State, and it is estimated that they have increased the annual buying power of the farm population by at least \$3,000,000.

Many orchard failures are directly traceable to the insufficiency of the water supply or the manner in which it is controlled and distributed.

Care and good judgment should be exercised in selecting an orchard tract. If the enterprise turns out well, the profits are high, but if it fails the losses are heavy.



Irrigated potatoes on the Shoshone project, Wyo.

## *Progress Report on Investigation of Reclamation and Rural Development in Seven Southern States*

A MEMORANDUM submitted to the Secretary of the Interior by the Bureau of Reclamation shows the progress made on the reclamation and settlement investigations being carried on in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee in cooperation with the State officials and experts of their agricultural colleges. It outlines the progress made in carrying out investigations recommended by the special advisers appointed by Secretary Work and composed of Howard Elliott, Daniel C. Roper, and George Soule. Their report was transmitted to Congress and printed. (Doc. No. 765, pt. 1, 69th Cong., 2d sess.) This report recommended that in continuing the investigation, plans be worked out for the creation of an organized farming community of at least 100 farms in each of the above-named States, which plans would include the following features:

- (a) Expert and experienced planning and supervision.
- (b) Provision of money to be advanced to settlers to help complete improvement and equipment of their farms. These advances to be repaid on long terms at low rates of interest.
- (c) Desirability of centralized responsibility and control in launching and guiding the experiment.
- (d) Desirability and necessity for success of cooperation among the private

local State and Federal Government agencies having related functions.

The tracts submitted by the States of North and South Carolina lie in the coastal plains region and are suited for general farming and truck growing. The reclamation work would consist of land clearing and extending drains.

The gross area of the North Carolina tract as tentatively selected is 6,000 acres. The tract selected in South Carolina comprises 8,015 acres. The area of the individual farm would be about 60 acres. Thirty to forty acres would be cleared, plowed, limed where necessary, and sowed to oats, rye, vetch, or other crops prior to the arrival of the settlers. The development aims to create a program so that a settler with small capital can make an adequate income for the support of his family the first year. The extension of his cultivated area could then be carried on by his individual efforts.

The tract in Georgia situated in Lee County comprises about 21,000 acres. The land has been cultivated under the prevailing tenant system. Agriculture has been unprofitable to both tenant and landlord.

The system of agriculture recommended by the State authorities is based on the "cow, hog, and hen program" and involves a farm unit of about 100 acres. The cash crops recommended are cotton,

tobacco, and truck. The farm program provides for 10 acres of pecans on each farm. The only reclamation required to bring this plan into operation is some additional drains for the quick removal of surface water.

The Florida tract is located west of Fort Lauderdale in the edge of the Everglades. Its gross area is 6,500 acres. The tract is bounded on the north and south, respectively, by the constructed North New River and South New River canals; and the additional reclamation works required would consist of roads, dikes, ditches, and pumps to provide for the close water control required for lands of this type. The State of Florida has recently authorized the issuance of bonds to the amount of \$20,000,000 to complete the drainage system of the Everglades and the chief engineer of Everglades district drainage is cooperating with the Bureau of Reclamation in the water-control studies as related to this tract.

The tentative agricultural plan is based on farm units of 20 acres each. The type of farming recommended is a combination of fruit, truck, livestock, and poultry.

In Alabama the area designated by the State authorities is in the "clover belt" or black prairie country about 20 miles west of Selma. It contains about 25,000 acres formerly devoted to cotton growing, which has become unprofitable since the advent of the boll weevil. The State agricultural authorities recommend dairy farming for this project. The typical farm would comprise 120 acres, 60 acres of which would be in permanent pasture and the remainder in hay and general crops. The land has practically all been in cultivation and little clearing or drainage will be required except tile drainage which may be required for certain types of soil.

The tract designated in Mississippi is near Richton on the Gulf, Mobile & Northern Railway, and comprises about 9,000 acres of cut-over pine land. It is a rolling country with good natural drainage, but the soil, being light, will require terracing on the steeper slopes.

The plan worked out here for farm operation by the State authorities contemplates a farm unit of 100 acres, 40 acres of which would be cleared, plowed, terraced, and planted to legumes in advance of the settlers' arrival. A program of general farming has been outlined, including livestock growing and crops, such as Irish and sweet potatoes, sugar cane (for sirup), cabbage, tomatoes, and turnip greens. A cannery for the latter product is in operation near the tract and has so



Stony Gorge Dam, Orland project, under construction, showing south abutment and mixing plant

far been unable to supply the demand for its output. Pecans, figs, grapes, satsuma oranges, peaches, and berries are among the opportunities for the settler who wishes to engage in fruit growing.

In Tennessee the tract selected is at an elevation of about 1,800 feet above sea level on the Cumberland plateau, adjacent to the station of Mayland on the Tennessee Central Railway. The project would include an area of 10,000 acres of rolling and somewhat broken land now covered with second growth timber of little or no commercial value. The fine sandy loam soils are susceptible of extreme crop diversification if properly fertilized. Reclamation work would consist in clearing part of the timber and in breaking, liming and seeding a portion of each tract. Some terracing may also be required.

The agricultural program outlined calls for the clearing of 50 acres of each 100 acre farm unit, and planting 20 acres of this in clovers and grasses. A type of general or mixed farming is recommended, including Irish potatoes, sweet potatoes, sorghum, small fruits and the dairy cattle, sheep, pigs, and poultry essential to the self-sustaining farm here as elsewhere.

All these crop programs are tentative. More information regarding soil conditions is needed on at least three of the projects. A soil survey of the Mayland, Tenn., tract is to be made by the experts of the United States Department of Agriculture. It will determine the depth of soil and variations in character. On the Selma, Ala., tract the soils are of such a varied character that a detailed soil survey will be necessary to determine the crops suited for each farm. This will be made by the Bureau of Soils of the United States Department of Agriculture in cooperation with the State. The Florida tract lies in the edge of the Everglades with muck and sand soils intermingled and soil and agricultural studies will have to be made to determine the behavior of this soil under intense culture. The other tracts with the possible exception of North Carolina are located in counties which have been covered by the surveys of the United States Bureau of Soils.

The aim in these crop programs is to include crops for which there is a market and which if grown in the rotation worked out will maintain and increase soil fertility. They are crops which can be successfully grown by the average American.

If these colonies were established it would mean an average of 150 home-owning farmers in each colony. Statistics are now being gathered to show what is being grown on each tract and the yields and values of the different crops. This will include a census of the live-

stock on each farm and the character and value of improvements and implements. Part of the land is uncultivated. Information will be obtained to show why it was not cultivated and how long it has been idle. A census of the cultivators and their families will be undertaken to ascertain whether they are white or colored and whether they are owners or tenants and the kind of houses they live in.

This information will show the gain which would come to these communities through the introduction of different crops, better methods of tillage, a rural organization for teamwork in business, especially in the cooperative marketing of their products and the influence which the example of these planned settlements will exert on the State as a whole.

Following the completion of the agricultural and soil surveys as outlined, a study of the settlement problem will be taken up, to answer the question fre-

quently asked as to where the settlers for these tracts will come from. In the course of this study it is planned to hold conferences in the different States where the representatives of the Bureau of Reclamation may meet the State authorities, representatives of the local chambers of commerce, railroad development agents large landowners and all others interested in the problem, so that plans may be worked out that will be adapted not only to general southern conditions, but modified to suit the local problems of each individual State. These conferences will probably be held in October, 1927.

George C. Kreutzer, director of reclamation economics, and C. A. Bissell, chief of the engineering division in the Washington office of the Bureau of Reclamation, left Washington on July 10, 1927, in company with S. L. Jeffords, agronomist, South Carolina State Extension Service. They will confer with the State authorities and visit the tracts in South Carolina, Georgia, and Alabama before the end of July.

## Reclaiming More Land

*Editorial from the Yakima Daily Republic*

**WE** almost have no patience with the theory to which some of the farmers have become attached that more irrigation and more production necessarily must mean more competition for them, against which they rightfully should be protected. If that idea had prevailed throughout the years past there never would have been any western country at all. The Yakima Valley would have belonged to the Indians to-day and the population, aside from the aboriginals, would have consisted mainly of jack-rabbits. Our 70,000 or 80,000 people, who are enjoying a fair measure of prosperity and are making reasonable progress toward greater prosperity, would not be here.

All over this country of ours, from one ocean to the other, for 150 years we have moved along with the idea that if we could bring in more people and get them into industries of one kind and another, and build up industries, it would be a good thing for all of us then engaged in industry or business of any kind.

That theory, on which the United States of America has been built, is just as good to-day as it ever was before. If it was fundamentally false in the beginning, it is so now; and if it was sound 20 or 50 or 100 years ago, it is sound to-day.

The question of competition for the irrigation farmer who is here now really

is nothing but a question whether, with the development which is possible, he should have the same number of neighbors that he has now or five times as many.

The notion that the development of our irrigation resources is merely a matter of production and sale of products is so wrong that it gives almost any thoughtful person the "willies." The Yakima Valley, under irrigation, first and above all other things is a place for homes and the rearing of children, and the building up of civic and community enterprises of all kinds. From the economic standpoint, after that it is a place where consumption will go along hand and hand with production.

There is not a farmer in the Yakima Valley who would not be better off, both as to the value of what he owns and as to the returns of what he produces, if we had here to-day—from Cle Elum to Kennewick—250,000 people instead of 100,000.

Our people should get the right slant on this matter, and they ought to stand together as one man for the further and complete development of the Yakima irrigation project. If they do not, they merely hold back and hurt themselves.

It is always better to begin dairying with a small herd of comparatively high-producing dairy cows than with a larger herd of low producers.



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



ONE of the delightful contacts made by the writer in a recent field trip was with a young woman engaged in women's

welfare work among the employees of the company she serves. Her alertness to every opportunity for betterment of con-

ditions prompted me to ask for a short story for the ERA, and it is printed as she presented it.

### Utility Girls Organized to Help All Housewives

By Alice Schuetze, general chairman, Central Power & Light Co.

One of the most noticeable events of the past few years has been the interest people have taken in the development of the resources of Texas. This wonderful State, so large in size and so rich in opportunities to those who are willing to work, is enjoying a period of development that is nothing short of startling.

To help in that development, one of the most interested and progressive utility organizations in the State, Central Power & Light Co., has recently organized its women employees into groups, meeting every month at their district headquarters for study. Each group of girls has a chairman and secretary who plan the programs that include only educational talks, demonstrations, and discussions. These educational talks on the better lighting of homes, proper refrigeration, sanitation, water supply, and kindred subjects are made often by the utility girls before women's clubs and other organizations.

The primary object of these meetings is to place the women employees of the company in a better position to serve the public. This is accomplished by educating them to understand the problems of the utility company and those of the public it serves. Thus each girl, as a representative of her company, may render assistance to the housewives of her community by bringing to them a better understanding of how their time and energy might be conserved by the introduction of modern conveniences.

One of the logical ways to make farm life less burdensome and more attractive is the introduction of modern labor-saving devices and other conveniences of city life. In bringing this fact home to the housewives the girls of the utility organization are rendering all assistance possible by demonstrations and suggestions.

In addition to the creation of a sympathetic and helpful understanding between the housewife and the utility girl, our utility girls are able to render valuable assistance in their communities by co-

operation with the local Girl Scouts, girl reserves, home demonstration agents, and similar organizations. They are also qualified to teach methods of safety and resuscitation.

Many times they have presented playlets and programs to the women's church societies and other civic organizations to help them in their undertakings and at all times this assistance is given cheerfully.

Nothing can require too much time or trouble if it will help develop the community in which the company serves. One hundred and fifty girls, all members of the Central Power & Light Co.'s organization and a great many of them members of these local clubs, create a tremendous force for good in a closer and more intimate understanding of the needs of the women and the company which serves them.

They are all efficient business women, progressive and enthusiastically carrying out their everyday tasks, but never forgetting to be courteous and patient to their public and always glad to better serve them.

### Will It Wash?

When a woman asks the clerk at the cotton-goods counter "Will it wash?" she usually refers to the fastness of the color. Neither she nor the clerk can be sure that the color is permanent unless a sample is washed under real laundering conditions. No one can tell by looking at a fabric whether or not it will run or fade. Even the so-called guaranty of a fast color may not mean much unless it has been given by a reliable manufacturer.

A washing test should show much more than fastness of color. It should tell whether the yarns will slip out of place when the fabric is laundered. Loosely woven materials often have this fault. Is the beauty of the fabric entirely due to the glossy finish? Will this be removed

when the fabric is placed in water? Are the spots or figures put in by means of such short threads that they will pull out when the material is washed? Are they made of a paste which will be removed by washing?

These points can and should be determined by the purchaser herself. There are innumerable good fabrics available. Select a firm piece, well constructed in every detail, and your cotton dress will not only wash but wear well. If you are unfamiliar with the wide range of cotton wash materials from which to choose, visit the nearest large department store, and get a number of samples to try out at home before you make your purchase.

### Facts

That the women contribute as actual farm producers is evidenced by data secured in a national survey conducted a few years ago by the Government. It was found that 26 per cent of the women helped with the livestock, 22 per cent helped with the field work on an average of nearly five weeks a year, 66 per cent took care of the gardens, 45 per cent helped with the milking, 93 per cent washed the milk pails, 76 per cent washed the separator, and 66 per cent made butter for sale, yet only 9 per cent had the butter money for their own use.

It was found that 89 per cent of the farm women took care of the poultry flocks which bring in an income to the farmers of America that is almost as great as that from the dairy business.

### Simplifying Home Sewing

If you do much sewing at home for yourself or your daughters, a foundation pattern for each one will simplify the cutting and designing of simple dresses. By that is meant an individually fitted plain pattern with normal seam lines, neck, and



armholes, which may be used as a fitting guide for checking commercial patterns and as a basis for planning decorative features. Such a permanent foundation pattern is best made in a firm cotton material. Unbleached muslin, cambric, or gingham is satisfactory for the purpose. The commercial pattern that seems best suited to the individual type of figure should be followed. It must first be carefully tested before the cloth pattern is cut. Sometimes a pattern bought by bust measure does not fit any other part. It may, therefore, be advisable to find a pattern that fits the shoulder measurements and alter it to conform to the bust before cutting the dress. Measurements of the figure should always be taken and checked on the paper pattern. The length of the sleeve varies frequently, for example, and the paper pattern must be lengthened or shortened accordingly. Neck, shoulders, and other parts may need still further fitting when the guide or cloth pattern is basted together and tried on.

A large checked gingham is suggested for the foundation pattern, because the warp and filling threads of the material are most easily seen. When the pattern has been completely fitted you can mark the straight of the material in each piece of the cloth pattern for convenience in cutting by making a slash 6 to 8 inches long, exactly following a thread.

A woman can fit her own foundation pattern, but it is better to have help.



Getting ready for the wool crop on the Carlsbad project, N. Mex.

After it has been fitted it may be cut down the center front and center back, and one-half used as a pattern for simple dresses, the other as a basis for designing. Almost any style of dress and many blouses can be designed from such a foundation pattern. Stitch all seam and dart lines with contrasting thread, making the pattern reversible. Also stitch all pieces one-eighth inch from the edge to prevent stretching. If the two sides are very

different, save the whole pattern, marking right and left sides plainly.

Orchard trees are often set out before the land surface is graded, provided no brush or trees must be removed. This is not good practice. It is better to anticipate the planting of trees by a few years of preparation.



Some one's "home, sweet home" on an irrigation project



## Contract for the Construction of the First Division of the Salt Lake Basin Project, Utah

THE act of Congress of March 3, 1925 (43 Stat. 1141), contained the following in connection with appropriations for the Bureau of Reclamation:

Salt Lake Basin project, Utah, first division: For construction of Echo Reservoir, Utah Lake control and Weber-Provo Canal, and incidental operations, \$900,000: *Provided*, That any unexpended balance of any appropriation available for the Salt Lake Basin project for the fiscal year 1925 shall remain available during the fiscal year 1926: *Provided further*, That no part of this appropriation shall be used for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law, or water users association or associations, providing for payment by the district or districts, or water users' association or associations, as hereinafter provided: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands.

Substantially the same provisions were repeated in the appropriation act of May 10, 1926 (44 Stat. 453). The appropriation act of January 12, 1927 (44 Stat. 934) made the unexpended balance of the 1926 appropriation available for the construction of the Salt Lake Basin project during the fiscal year 1928.

The Weber River Water Users' Association was organized for the purpose of cooperating with the United States in the construction of the first division of the project, involving (a) the building of a storage reservoir on Weber River near Echo, in Summit County, Utah, and (b) the digging of a canal near Kamas, Utah, known as the Weber-Provo diversion canal, for the diversion of water from the Weber River to the Provo River. The Echo storage reservoir is to have an estimated storage capacity of 74,000 acre-feet. A large number of canal companies in the Weber and Provo River Valleys have subscribed for stock in the association, giving mortgages upon their irrigation systems to secure the payment of the assessments that will be levied to secure the construction charge payments to be due to the United States when the Echo Reservoir and Weber-Provo Canal are completed. The water users under the subscribing canals have a partial water supply at the present time, but need storage in order to supplement their natural flow water rights, so that crops requiring water late in the season may be successfully grown.

The Echo Reservoir lies lower down on the Weber River than the point of diversion of the Weber-Provo diversion canal, and the plan, so far as the irrigation of Provo River land is concerned, is to divert water for subscribers on the Provo watershed at flood times when the earlier priorities on the Weber River are receiv-

ing their full quota or at lower stages of the river when water can be released from Echo Reservoir to supply early priorities in lieu of the water diverted at the take-out of the Weber-Provo diversion canal. In the words of the contract: "The United States will furnish to the association \* \* \* capacity in the said Weber-Provo diversion canal up to but not to exceed 210 second-feet, together with the right to divert surplus water from the natural flow of the Weber River from May 1 to August 1 of each year in such amount not exceeding 210 second-feet as is sufficient, when beneficially used for irrigation purposes through existing canals, diverting water from the Provo River above its confluence with the South Fork of the Provo River near Vivian Park at a duty not lower than 1 second-foot for 60 acres of land, to maintain the flow of the Provo River just below its confluence with the South Fork of the Provo River near Vivian Park, Utah, up to but not exceeding 510 second-feet after which said Echo Reservoir shall be filled once each and every yearly period from November 1 to the following October 31 as against the right to divert through said Weber-Provo diversion canal the difference between what is actually required to maintain said flow in the Provo River near Vivian Park, Utah, at 510 second-feet as aforesaid and said 210 second-feet and also as against the right to divert an additional 790 second-feet from the Weber River to the Provo River which may be required for developments which may be provided by the United States in the future in connection with the Salt Lake Basin project. It is expressly understood that capacity only in said Weber-Provo diversion canal is hereby disposed of by the United States, and that title to said Weber-Provo diversion canal remains in the United States, so that the United States may enlarge said canal for other possible developments which the United States may undertake in the future in connection with the Salt Lake Basin project."

The association agrees to distribute the water under the provisions of the reclamation law, and is not to furnish or deliver to any one landowner water in excess of an amount sufficient to irrigate 160 acres of land. After the Echo Reservoir and Weber-Provo diversion canal are constructed they are to be operated by the association.

The construction cost is to be paid in 20 equal annual installments, the first payable December 1, after the reservoir and canal are completed, and remaining installments on December 1 of each of the 19 years thereafter. The maximum construction expenditures under the contract are \$3,000,000.



Spillway, Strawberry Valley power house, Strawberry Valley project, Utah

## McKay Dam Dedicated



McKay Dam, Umatilla project, Oreg.

**T**HE following account of the dedication of McKay Dam is written by a participant in the celebration:

May 10, 1927, was a gala day for Oregon. Federal and State authorities, engineers, a good representative group of farmers and their families, and business men journeyed to the McKay Dam to take part in the celebration marking the release of the first storage water from the McKay Reservoir.

Dr. Elwood Mead, Commissioner of Reclamation, accompanied by Mr. William Cattanaach, chairman of the State rivers and water supply commission of Victoria, Australia, Mrs. Cattanaach, and others arrived in a business car of the Union Pacific. The car was set out at Pendleton and the trip to the dam, a distance of 8 miles, was made by automobile.

When the official party arrived there was a good-sized gathering. An address of welcome to the visitors, including expressions of felicitation and gratification at the completion of this monumental work, was made by Governor Patterson. He was followed by Commissioner Mead, Congressman Sinnott, and Senator Steiwer.

Mr. William Mulholland, chief engineer of the city of Los Angeles, gave a short talk. He was accompanied by his assistant, Mr. Van Norman. They made the trip specially to see this new type of dam, which has some unusual engineering features.

The dam is constructed of gravelly material of the largest volume ever used, with a heavy reinforced concrete face connecting with bedrock. It is 160 feet

high and 2,600 feet long, and took a little over three years to build. The reservoir thus formed, has a capacity of 75,000 acre-feet. It was constructed by Government forces at a cost of \$2,298,823, which is \$200,000 less than the engineers' estimate.

After these talks Governor Patterson and Commissioner Mead each turned a wheel operating the two needle valves which released the first storage water from the reservoir. A photograph was taken of this scene, which shows the back

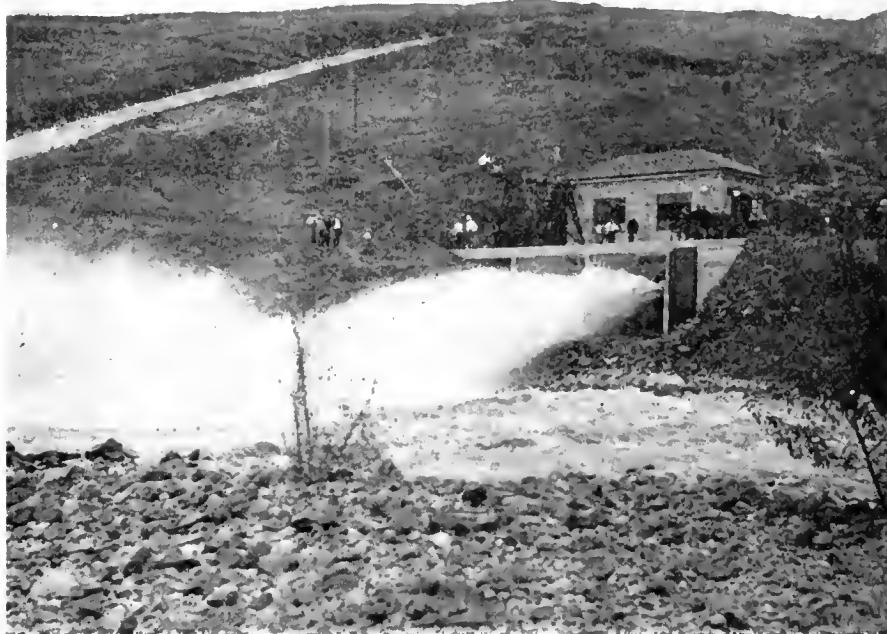
of the dam, with spillway to the left. It was a most impressive ceremony and one which must long linger in the memories of those who were present.

Following this the official party departed and a motor caravan formed for a trip through the territory to be benefited by the storage water in the Stanfield, Westland, and Hermiston districts.

## Shoshone Water Users Will Conserve Water

The Deaver Sentinel states that the commissioners of the Deaver irrigation district, Shoshone project, Wyoming, adopted a resolution recently recommending that no small streams of irrigation water be allowed to run continuously, as it is their opinion that this practice is a very large factor in the seepage of the land. The water users of the division have been asked to cooperate with the Bureau of Reclamation in preventing waste of water. The commissioners also pointed out that the cost of operation and maintenance can be materially reduced if all water users will burn the weeds on their farm units and keep their chutes and flumes in good repair.

In Yakima Valley, Wash., the irrigation season for orchards extends from about April 15 to September 15. The number of irrigations runs from 5 to 10 and averages over 7 in the season.



Releasing the first stored water from McKay Dam, Umatilla project, Oreg.

# Return Flow and Its Problems on Reclamation Projects

By E. B. Debler, Engineer, Bureau of Reclamation

WHEN water is applied to the earth's surface naturally through rains and snows or artificially by irrigation it is disposed of in a number of ways. A part passes away immediately or very soon as surface run-off or evaporation from the surface of the snow, ground, or from the exposed surfaces of plants which catch the moisture. Another part enters the ground and is in part returned to the surface by capillary action to replace water evaporated from the surface. Some is taken up through the roots of plants and evaporated in the growth processes of the plant or stored in the plant structure and hauled away as a plant product. The remainder passes beyond the limit of capillary action and joins the mass of water existing under the ground surface, there generally to form part of a moving stream seeking a lower level, and reappearing in the form of seepage, springs, or artesian flow, the particular name popularly applied being dependent on the concentration of flow and the pressure with which it reaches the surface. The reappearance of these waters may be but a few hundred feet from the source thereof, or it may be several hundred miles, depending entirely on the ground structure and topography.

In the arid regions the term "return flow" is more properly used in designating the increase therein due to the application of irrigation water. This includes waters lost by seepage from canals and reservoirs, as well as waters applied by the irrigator to his land. Such return flow is in these places particularly prominent, as the return flow from precipitation prior to irrigation development is usually so small that the stream in its passage through the region actually loses a part of the water it brings from its mountain sources, at times drying up completely. With irrigation development such conditions are materially changed and living streams often result therefrom.

The water lost by evaporation, including plant transpiration and water stored in the crops that are removed, is termed the "consumptive use" of water. It has been found generally that where sufficient water is applied to maintain the growth of plants at a near maximum rate the application of additional water results in a corresponding increase in return flow, as the consumptive use increases very little, such increase in use being due to slightly greater opportunity for evaporation. Consumptive use is not, however, uniform, as it is greatly affected by soil, crop, and climatic conditions. From the few investigations thereof, seldom sufficiently complete for

well-grounded conclusions, consumptive use of water on cultivated lands is estimated to vary from 1 acre-foot per acre annually in high mountain valleys to 3 acre-feet in localities like Imperial Valley. Rice lands use much more water.

## EFFECT OF IRRIGATION

The first result of the escape of unused irrigation water is to raise the underlying water table and thereby gradually increase the amount of pressure head available to force this water through the ground structures intervening between the point of application of such water and the natural stream channels which it seeks. In some localities the ground structure is so open through the existence of broken rock or coarse gravel delta formations that a very slight rise in ground water will provide all of the needed pressure head to carry away unused water, and drainage problems do not develop. In a great many localities and over large areas the ground structure is, however, such that the velocity of water flowing through it is very slow, with the result that the underground streams are incapable of carrying away the excess water applied and the water table is built up higher and higher until it reaches the top soils and affects plant growth or even reaches the surface and floods it. Artificial drainage is then necessary.

## ANNUAL DISTRIBUTION AND AMOUNT

Where irrigated lands lie close to stream channels and the ground structures are open, return flow is heavily concentrated in the irrigation season, reaching a maximum shortly after irrigation diversions have reached a maximum and with winter flow but a small fraction of summer flow. With large irrigated areas underlain to great depths with permeable deposits, return flow continues throughout the year, in some instances at almost uniform rates. In this respect return flow acts just as do ordinary streams which in sand-hill and lava regions often show remarkably uniform flow, whereas streams in clay, shale, or impervious rock regions will fluctuate with the precipitation. The most common condition found is one where winter return flow is from one-third to one-half of the maximum rate in late summer.

The average irrigation system delivers, at the farm, about 60 per cent of waters diverted. With ordinary irrigating methods about one-third of the delivered water escapes beyond the reach of plants. Of the diverted waters, 60 per cent becomes

return flow and reenters the streams for further use unless intercepted. In extreme cases with diversions as high as 15 acre-feet per acre, return flow may reach 90 per cent of diversions and on concrete-lined systems with favorable soils may fall as low as 25 per cent.

## UTILIZATION

In every case return flow augments the irrigation water available in the late summer after the stream flow, due to melting snows, has declined to less than the irrigation requirements of lands dependent thereon, and in that way serves a similar purpose as do storage reservoirs, but with the advantage over ordinary reservoirs that there is no loss from evaporation. In practice the effect has been to materially improve water rights on the lower portions of stream systems due to irrigation development on the upper reaches. In some cases the irrigation systems that have produced such return flow have been able to benefit in that less water is thereafter necessary to be passed down the stream to care for prior rights.

In many localities streams leave their mountain sources with sufficient gradient to move large masses of sand, gravel, and cobbles whenever in flood. These materials are deposited in the traversed valleys or in characteristic delta cones where the stream enters a large valley or the plains. Ordinary stream flows usually sink in these formations to reappear at some distance, under favorable conditions. The natural outflow from these underground streams and reservoirs has, in many places, been artificially increased by means of artesian wells and pumping, often to the point of excessive depletion as evidenced by permanent lowering of the water table. In places it has been found possible to materially increase the yield of such underground streams and reservoirs by facilitating increased stream losses during floods by spreading the flood water over the heads of the valleys and deltas.

## RETURN FLOW ON FEDERAL PROJECTS

On the Boise project, Idaho, the Notus division is entirely supplied by drainage waters from another portion of the project and is therefore entirely dependent on return flow, the division having no canal connection with natural streams. The return flow in this case takes the place of storage which is supplied to other project lands from the Arrowrock and Deer Flat Reservoirs.

On the North Platte River in Wyoming and Nebraska, early irrigation and power development established rights to an amount of water materially exceeding the ordinary stream flow of the river in late summer. With the progress of irrigation under the canals of the North Platte government project, return flow has developed to such an extent that much less water must be by-passed at the Whalen Dam than formerly anticipated, with water supply for prior rights below the project limits much improved over conditions existing in earlier years. Return flow from lands under Government canals is supplied to a number of canals under Warren Act contracts in the vicinity of Scottsbluff and Bridgeport, Nebr., as part of a supplemental supply, in lieu of Pathfinder Reservoir storage water. Where the North Platte River, prior to the time of irrigation development, seldom discharged more than 500 or 600 second-feet during the winter at Bridgeport, the river now carries a stream of 1,600 to 2,000 second-feet throughout the winter, even though the natural flow of the river at Pathfinder Reservoir is entirely cut off.

On the Umatilla project in Oregon, the lands under the west extension division are almost entirely dependent on return flow from the Hermiston division and some smaller areas adjacent to Umatilla River in the immediate vicinity, with a large increase in this supply anticipated when the McKay Reservoir water is put to use on the lands south and west of Hermiston.

By an appropriate stipulation in the adjudication decree of Snake River, the Minidoka project in Idaho is credited with the net gain in Snake River from Neeley to Milner Dam, such gain being due to return flow from the project and amounting during the irrigation season to several hundred second-feet over and above reservoir evaporation losses through Lake Walcott. As the Minidoka project is underlain with lava formations of unknown depth and very open, a large part of its return flow returns to Snake River beyond Milner Dam and is not available for irrigation use.

On the Rio Grande project, New Mexico-Texas, the Hudspeth County water improvement district in Texas, comprising some 20,000 acres of high-class agricultural land, is entirely dependent on return flow and waste water from project lands, and largely so from the El Paso Valley lands in Texas alone, as the El Paso Valley in turn uses return flow from Mesilla Valley in New Mexico and Texas.

#### QUALITY OF RETURN FLOW

Precipitation reaches the earth in a comparatively pure state, but upon con-

tact with or passage through the ground, products of mineral and organic decomposition are dissolved. It is only the inorganic or mineral salts that are of interest in this discussion. With ample precipitation, liberated soluble mineral salts are removed almost as fast as they become available without concentration in stream flows. In the arid regions, however, precipitation is usually insufficient to prevent highly mineralized soils and their effluent is often heavily charged with salts. The streams leave their mountain sources with notably pure water, which increases in mineral content in passing through the arid regions, due to influx of more highly charged water and concentration by evaporation of the stream itself. Upon applying such waters for irrigation, a negligible part of the salts carried to the lands are stored in the plants and removed. The water evaporated by the plants and soil leaves its salts and if these salts are of deleterious character they must be added to the salt content of the water passing away as return flow if irrigation is to continue indefinitely. The return flow in its slow percolation through the soil strata has further opportunity to become heavily charged with salts. In some cases the dissolved salts combine chemically with others found in place on the land to form insoluble precipitates that may be either beneficial or harmful. The suitability of return-flow water for irrigation purposes as indicated by the tolerance limit of crops, depends on the character and concentration of the dissolved salts in such water and in the soils on which it is to be used, the permeability of the soils and subsoil, provisions for drainage, crops to be grown, amount of water available for flushing purposes, and rainfall.

#### LEGAL STATUS

As stated, early irrigation development was largely confined to lands contiguous to streams from which they were served by short canal systems. The underlying soils were usually loose stream-washed materials which facilitated the quick return of unused waters to the stream without producing surface streams of material volume. Later developments of large areas, often at great distances from the source of water supply, resulted in many hitherto dry channels becoming living streams capable of supporting irrigation on material land areas. Artificial drainage to relieve alkali and seepage conditions also contributes large amounts of water. Increasing values of irrigation water and the exhaustion of water supply obtainable at moderate costs often furnished the incentive for recapture of return flow, including drainage waters, by

the project producing it, and almost invariably resulted in litigation as other irrigators already using these waters were deprived thereof, although usually having made no expenditure to produce the water supply used by them. State irrigation laws having generally been framed before return flow became a recognized factor in irrigation supply are, on the whole, in a rather unsatisfactory shape. The decisions regarding return flow are therefore in conflict. The general tendency, however, is to regard return flow in all of its forms recoverable by the agent producing it until it enters a stream which in its natural condition supplied irrigation diversions, when it becomes a part of such stream and subject to appropriation therefrom as are other waters of the same stream. The result is a material aid to new projects which can be arranged to utilize their return flow by sale to other projects needing such supplemental supply or by project extension. At the same time such decisions do not strike at vested rights which have been built up from the use of return flow under earlier development when such return flow was rarely sufficiently concentrated in volume to become a bone of contention.

#### NEW PROJECTS

On new projects the consideration of the return flow becomes a very important factor. If materially impeded by flat topography or impervious strata, it must be supplemented by artificial drainage. The localities of appearance of return flow are most important. In general, irrigation was initiated along the streams in their lower courses with development spreading therefrom to adjacent higher lands and upstream valleys. With the irrigation of adjacent higher lands which in themselves are usually adequately provided with natural drainage, the limited underdrainage along the borders of the lower valleys becomes overloaded and seepage follows, requiring protective border drains to avoid destruction of valley property.

Project return flow, if of suitable quality and properly located, may be used to replace stream flow belonging to prior appropriations and which under such circumstances can then be diverted for the project. Or project return flow may be used to extend the project area, usually with material reduction in project acre construction costs. Where runoff is limited and arable lands are in excess of the available water supply, development plans should have in view the greatest practicable use for all return flow. The solution of these problems requires careful estimates of the quality, quantity, and seasonal distribution of return flow.



## Bureau of Reclamation Receives Diploma and Medal of Honor

*Sesquicentennial award of high honors for excellence of exhibit at International Exposition, Philadelphia, 1926*



Medal of honor awarded to the Bureau of Reclamation (reduced about one-half)

THE Bureau of Reclamation has received recently a diploma of award and a medal of honor from the bureau of awards of the Sesquicentennial Exhibition Association for the excellence of its exhibit at the Sesquicentennial International Exposition at Philadelphia. Reproductions of these are shown in the accompanying illustrations. (See back cover page.)

The diploma of award was designed by Frank V. Dumond, artist. Its significance is in the dominant figure of "Spiritual and National Consciousness," offering the palm of peace and the wreath of laurel at the National Altar upon which is the Liberty Bell emitting the eternal flame of Liberty from which the Arts and Sciences light the lamps and torches of creative imagination and pass them into the hands of Industry and Commerce to illuminate and inspire their activities. The upright panel to the left represents the year of Independence. The upper half of this panel is a portrait of George Washington with a background of the flag of his day. Beneath him are the supporting human elements of his struggle—the Patriot Soldier, the Woodsman, and the Pioneer.

The panel to the right in its upper half presents the figure of Liberty at the moment of the Centennial Exposition against a background of the flag at that time. Beneath her are the contemporaneous supporting human activities of Agriculture, Metal Working, and Mining. A slight Pennsylvania note is given

through the keystones employed in these panels.

In the main central part of the composition are epitomized suggestions of mining and of modern blast furnaces and also Agriculture as a background to the figure of Industry. As a background to the figure of Commerce are the modern railway and the grain elevator, with freight and ocean shipping seen against the skyscrapers of a modern city. The whole idea stresses the irresistible spirit and the unlimited achievement which still arises from the inspiring flame of Liberty. The excerpt from Roosevelt's St. Louis speech is apropos since the design sets forth an idea of what he refers to as the "Higher Life"—or as one might say, Spiritual Guidance.

The medal of honor was designed by Albert Laessle, sculptor. The Spirit of America, awaking to the full potentialities of its 150 years of its independence stands watchful, resourceful, protective, symbolized by the alert and decorative form of a young bald eagle, the mother of freedom who guards the home nest of peace and prosperity.

To stress the fecundity of America and its promise for the future the sculptor has purposely chosen the mother eagle and has placed within the nest the eggs which are the symbol of continuing productivity.

The nest itself, fashioned of oak, bespeaks the strength of the American home and the American Nation, while in the background, whence sprang the eagle of freedom, Independence Hall is outlined against the rising sun of American prosperity, happiness, peace, and contentment.

## Charges Collectible Though Water Cut Off

The case of *United States v. Parkins* (Wyoming Federal District Court, 1926, 18 Fed. (2d), 643), although coming up from a reclamation project under the Bureau of Indian Affairs, is of interest to the Bureau of Reclamation and to the irrigation districts and water users' association operating Government reclamation projects.

Defendant Parkins owned 106 acres of irrigable land under the Wind River Indian irrigation project. The act of Congress of August 1, 1914 (38 Stat., 582), provides that the Secretary of the Interior may fix maintenance charges on Indian irrigation projects, "which shall be paid as he may direct." For the Wind River project the maintenance charges for 1914 to 1919 were fixed at 60 cents per irrigable acre, for the years 1920 to 1923 at \$1 per irrigable acre, and for 1924 at \$1.50 per irrigable acre "for each and every acre of irrigable land under said project."

Defendant Parkins in 1921 failed to pay these charges, and the water was shut off. He made application for an extension of time to pay the charges then due, which he agreed to pay before October 1, 1921. He was then given water, but failing to pay either the back charges or the charges for later years, the water was again shut off, so that the defendant received no water for the years 1922 to 1924. The suit was brought by the United States to recover maintenance charges, including charges for 1922, 1923, and 1924. The defendant maintained that for the years 1922, 1923, and 1924, he did not receive water, and therefore that for these three years he could not be charged for the use of it.

The court says:

The answer to this by counsel for the Government is that the Secretary of the Interior being authorized by Congress to make rules and regulations for the government of such projects, and fix maintenance charges, providing the manner in which they shall be paid, which in this instance is admittedly upon the basis of irrigable acreage under the project, the obligation of the defendant became fixed and definite, and is recoverable in an action brought for that purpose. In this we see no defect in establishing the obligation of the defendant, he having been during all the period the owner of the land for whose benefit the water was used or might have been used. That he did not have the use of the water for the years 1922 to 1924 was owing to his own fault in either failing to pay the assessed charges or in making satisfactory arrangements for the use of the water upon agreement to pay in the future.



## United States may not by Contract Assume Liability for Death or Personal Injury

IN a decision dated July 13, 1927 (A-19031), and addressed to the Secretary of the Interior, the Comptroller General holds that the United States may not by contract assume liability for claims based upon personal injury or death. In connection with the Salt Lake Basin project, Utah, the construction of the Echo Reservoir is planned. Within the flow line of the reservoir there are certain tracks of the Union Pacific Railroad Co. that must be moved to higher ground before the reservoir is filled. In negotiations with the railroad company for the moving of its tracks, the company insisted upon the insertion in the contract of an article by which as a part of the

cost of the work the United States would reimburse the company for all cost and expense because of liability growing out of personal injuries or death or property damage incident to the work of moving the tracks.

The Comptroller General says: "It is recognized it might be argued as you state, 'that the reclamation laws have authorized the Secretary to construct reclamation works and to make such contracts as are reasonably necessary to accomplish this purpose, and that the indemnification of an indispensable contractor for the loss and expense he may incur in the doing of work for the United States is reasonably necessary for the

accomplishment of work,' but this office can not agree with your suggestion that the argument is plausible in view of the fact that legislation for many years has authorized payment of claims under certain circumstances for loss or damage of property but has failed to include claims for physical injuries and death. The Congress has reserved to itself the consideration and disposition of such claims. \* \* \* You are advised that you may properly stipulate for the assumption by the United States, not to exceed the amount of available appropriations of claims for loss or damage caused to owners of land or other private property in the removal of the railroad tracks, etc., in question in connection with the construction of the Echo Reservoir, but unless and until Congress shall have authorized stipulations to indemnify payment of personal injury and death claims, you are not authorized to enter into such a stipulation in the instant matter."

## State Highway Systems In Reclamation States

More than 13,600 miles of earth roads included in the State highway systems of the 48 States were surfaced by the several highway departments in 1926. The following tabulation gives the figures for the Reclamation States:

State highway systems in reclamation States

State	Total mileage in State systems	Existing mileage at end of 1926	Mileage of new surfacing placed during year, including reconstruction
Arizona.....	2,031.4	1,421.5	75.0
California.....	6,582.1	3,537.9	265.4
Colorado.....	8,966.6	3,499.3	295.3
Idaho.....	4,668.4	2,437.6	269.4
Montana.....	7,957.2	926.9	119.2
Nebraska.....	6,256.0	2,764.1	833.8
New Mexico.....	9,214.4	1,684.8	73.9
North Dakota.....	6,837.8	1,335.4	539.4
Oregon.....	4,468.6	3,220.4	293.6
South Dakota.....	5,923.5	2,467.8	444.8
Texas.....	18,728.0	9,256.3	497.1
Utah.....	3,248.7	1,189.8	150.0
Washington.....	3,283.6	2,607.3	96.2
Wyoming.....	3,136.2	929.1	129.4
Total.....	94,298.5	38,300.8	4,272.2

EXCAVATION for the foundation of Gibson Dam, Sun River project, continued during the month on both north and south abutments, resulting in the removal of 5,500 cubic yards of solid rock and 2,600 cubic yards of earth and loose rock.

## Yuma Mesa Grapes Bring \$200 a Ton

Thompson seedless grapes grown on the properties of Dr. Harry Reese, on the Government experimental station land and the Morrell and Lane vineyards on the Yuma Mesa have been contracted for at \$200 a ton, on the vine, according to the Yuma Morning Sun.

Mulford Winsor purchased the grapes and intends to ship them to the eastern markets.

It is believed that the Yuma Thompsons are the first of this variety to move, first shipments having been made about the middle of June.

## Crop Prospects Good For Idaho Projects

With soil and climatic conditions ideal, the rapid filling of reservoirs, and the arrival of warmth and sunshine to counteract the backward spring, general conditions in Idaho have been reported by A. H. McConnell, secretary of the Central Western Shippers' Advisory Board of Idaho, to be the most favorable, as reported in the Burley Bulletin, Minidoka project.

Estimates furnished Mr. McConnell by commodity committeemen place ship-

## Payment of Irrigation District Taxes

In the case of Horsefly Irrigation District v. Hawkins (decided by the Supreme Court of Oregon, April 5, 1927, 254 Pac. 825), it was held that an Oregon taxpayer may not divide his taxes, paying his other taxes, but leaving his irrigation district taxes unpaid. The court says: "The law contemplates that all the taxes against lands, in such a district, should be paid together. An owner of lands in a district of either kind mentioned (irrigation or drainage) does not have the right to pay the other taxes upon his property and leave the district taxes unpaid, and then defeat their collection in the regular manner."

ments of lambs at 3,300 cars, fruits and vegetables 6,500 cars, prunes from 1,800 to 2,000 cars, cherries 20 cars, onions 500 cars, early potatoes from 12 to 15 cars, lettuce 15 cars, potatoes 20,000 cars, beans 1,600 cars, canned goods 80 cars, and cattle 1,000 cars.

Increased production of dairy products, eggs, and dressed poultry is indicated. Increased acreage and ideal weather conditions furnish the basis for the prospect that Idaho will have a larger tonnage of small grain to move this year than at any time during the past 10 years.

## Organization Activities and Project Visitors

**D**R. ELWOOD MEAD, Commissioner of Reclamation, left the Washington office on July 10 for a short trip to the West. He will accompany Secretary Work over several of the projects. On August 1 Doctor Mead plans to sail for Palestine for a study of and report on the reclamation work in that country under the jurisdiction of the Zionist Organization.

P. W. Dent, former assistant to the commissioner, has been appointed Assistant Commissioner of the Bureau of Reclamation. He remains in charge of the legal work as chief counsel.

George C. Kreutzer, director of reclamation economics; Charles A. Bissell, chief of the engineering division of the Washington office; and R. T. Bladen, jr., photographer, left the Washington office by automobile on July 10 to visit and photograph a number of the properties in the South suggested for study as typical examples of opportunities for planned group settlement.

E. R. Dexter has been reinstated as instrumentman on the Grand Valley project.

F. H. Henshaw, district engineer of the United States Geological Survey, was among the recent visitors on the Klamath project.

Rhea Luper, State engineer of Oregon, and B. E. Hayden, reclamation economist, visited the Vale project during the month.

Ray P. Teele, Porter J. Preston, and Charles A. Engle who are making an engineering and economic survey of reclamation and Indian irrigation projects, spent several days recently on the Okanogan project.

Alan B. Sheldon, of the Denver office, has been transferred to the Kittitas division of the Yakima project.

C. W. Wood, junior engineer, has been transferred from the Guernsey Dam, North Platte project, to the Kittitas division, Yakima project.

Ex-Governor J. G. Scrugham, special adviser on the Colorado River development, was a recent visitor at the Denver office.

Karl Keeler, formerly in the drafting section of the Washington office, has been transferred to the Truckee-Carson investigations.

### *Standardization Basis of Better Marketing*

*Standardization of farm products is the definite foundation on which rest most of the individual functions which make up the whole process of marketing, according to Lloyd S. Tenny, Chief of the Bureau of Agricultural Economics of the Department of Agriculture.*

*"Standardization facilitates the settling of disputes between shippers and dealers; it is the only safe basis upon which equitable inspection services can be built at shipping points and markets; it is especially useful in cooperative marketing by affording a basis for pooling the products of various growers; it is a prime requisite in administering the United States warehouse act."*

Barry Dibble, former project manager of the Minidoka project, was on the project recently collecting data for a report on credits for the Burley and Minidoka irrigation districts.

J. H. Jacobsen, crop statistician of the United States Department of Agriculture, with headquarters at Boise, Idaho, visited the Burley office of the Minidoka project recently to check up on the crop situation.

An appraisal of the Payette division lands on the Boise project has been completed by a board comprising B. E. Hayden, reclamation economist, representing the Department of the Interior; O. A. Cox, farmer, representing the Black Canyon district; and Frank T. Morgan.

Among recent visitors to the Riverton project were Gov. Frank C. Emerson, of Wyoming; Fred W. Sargent, president; G. B. Vilas, general manager; C. T. Dike, engineer of maintenance; F. W. Hillman, assistant engineer of maintenance; H. E.

Dickenson, general superintendent of lines west; F. J. Byington, assistant general superintendent of lines east; and seven other officials of the Chicago & North Western Railroad.

John S. Conway, Deputy Commissioner of Lighthouses and a former employee of the Bureau of Reclamation, spent two days on the Lower Yellowstone project. He was particularly interested in inspecting concrete work, of which he was in charge about 1906.

Frank Hill, chief dragline operator, Newlands project, has resigned to accept a position with the Truckee-Carson irrigation district.

Carl Knutson, chief dragline operator, and Andrew Springer, dragline operator, Newlands project, have resigned to accept positions in Mexico.

Recent visitors to the Milk River project included Hon. Scott Leavitt, Member of Congress; W. H. Wattis, general manager, and W. Y. Cannon, local manager of the Utah-Idaho Sugar Co.; C. D. Greenfield, agricultural development agent of the Great Northern Railway; and C. B. Phillips, entomologist, State extension service.

Lansing Su, a Chinese student at the University of Idaho, spent two days on the Yakima project inspecting irrigation structures on the Sunnyside division.

W. D. Wood has been employed at Gibson dam, Sun River project, to take charge of the concrete testing laboratory and to act as concrete inspector.

E. J. Bell, jr., of the agricultural college at Bozeman, Mont., accompanied by County Agent Clarkson, visited the Sun River project recently to secure preliminary information concerning the economic survey that is to be made of the irrigated farms on the project.

A. Mitchell, manager of the Western Labor Agency at Sacramento, has made an inspection of the Stony Gorge reservoir site, Orland project, with relation to clearing the timber suitable for fuel purposes.

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Kansas City, Mo.

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# NEW RECLAMATION ERA

VOL. 18 SEPTEMBER, 1927 NO. 9



BACK TO SCHOOL. THERE ARE NEARLY 700 SCHOOLS ON THE FEDERAL IRRIGATION PROJECTS

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
WASHINGTON

*July 30, 1927.*

*To the officers and employees of the  
Bureau of Reclamation:*

***B**EFORE my departure on a two months' vacation in Europe I desire to express my appreciation of your services and my gratification at the increased prosperity of the farmers on the Federal reclamation projects and the satisfactory relations which exist between the bureau and water users on Federal projects. This is due in a large measure to the tact, industry, and interest of the administrative and other officers of the bureau. I feel sure that this year is to be an outstanding one in Federal reclamation, and desire to bear testimony to the contribution made to this by the bureau's staff.*

*ELWOOD MEAD,  
Commissioner.*

# NEW RECLAMATION ERA

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Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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## *Interesting High Lights on the Reclamation Projects*

ONE of the farmers on the Newlands project, Nevada, harvested a crop of \$20 gold pieces recently while digging post holes for a corral fence. About \$1,200 was found, and it is supposed that the money was buried about 40 years ago by some one who had stolen it. Most of the farmers on the projects are digging gold out of the land in the form of agricultural products.

AT Stony Gorge Dam, Orland project, California, an average force of 163 men was employed during the month in placing 2,344 cubic yards of concrete, excavating 241 cubic yards of earth and loose rock and 3,695 cubic yards of solid rock, and in placing 59,300 pounds of reinforcing steel. At the end of July the dam was 38 per cent completed.

THE season's apricot crop on the Orland project was disposed of largely to Sacramento canneries through the local marketing association of apricot growers.

ON the Uncompahgre project, Colorado, the Colorado Potato Growers Cooperative Association is planning to handle the bulk of the potato crop and also a large part of the onion crop.

THE recent closing of the Boise Creamery Co.'s plants at Boise and Meridian, Boise project, Idaho, on account of insufficient capital will probably result in reorganization on a cooperative basis and on a much larger scale, including powdered milk among the products.

THE Boys and Girls Junior Farm Bureau Camp was held at the University of Nevada farm at Reno recently. The Newlands project had a representation of more than 60 members out of a total of 319, and succeeded in capturing several prizes.

DAIRYING continues to maintain an important place among the industries on the Minidoka project, Idaho. Practically all the milk and cream produced on the project is marketed through the Mini-Cassia Dairymen's Association or sold direct to the cheese factories and small creameries on the project. A milk condensary at Burley, to be known as the Idaho Star Milk Co., is being promoted by San Francisco interests.

THE Southern market for certified seed potatoes from the Milk River project continues firm, and a visit of potato men from the Louisiana district to the project is anticipated shortly to inspect the crop and complete delivery contracts.

WORK has been commenced by the Northern Pacific Railway on a branch line from Glendive to Brockway, Lower Yellowstone project, a distance of 62 miles. This will open up a territory heretofore without railroad facilities.

THE Malin Cheese and Produce Co., Klamath project, had added improvements to its plant to the value of about \$8,000, and now manufactures butter, ice, and ice cream in addition to its regular output of 40,000 pounds of cheese a month.

THE Belle Fourche project is decidedly on the upgrade. The sugar factory has completed the installation of machinery, and housing erection is making excellent progress. The three new pickle stations at Newell, Vale, and Fruitdale are completed and ready to receive the cucumber crop. Laying of rails on the Vale beet spur will be completed shortly. A new elevator is to be erected at Vale by the Tri-State Milling Co. to receive this year's crop. Graveling of State highway 212 through the project began early in August.

AT least \$90,000 is invested in poultry houses on the Newlands project; and the 70,000 hens are producing on an average 75,000 dozen eggs a month, worth approximately \$22,000.

DURING the month 10,000 posters, advertising opportunities for home-seekers on the Tule Lake division of the Klamath project, the Willwood division of the Shoshone project, the Pavilion division of the Riverton project, the Interstate, Fort Laramie, and Northport divisions of the North Platte project, the Belle Fourche project, and the Lower Yellowstone project, were sent to a selected list of post offices in the States of Washington, Oregon, California, Idaho, Utah, Montana, Wyoming, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Arkansas, Minnesota, Mississippi, and Louisiana. Large numbers of inquiries are being received daily by the Washington office.

GROWERS on the Okanogan project, Washington, estimate that the apple crop this year will amount to 800 to 1,000 cars.

THE general agent of the Northern Pacific Railway, located at Yakima, has completed recently a summary of the shipments of hay and grain from the Yakima Valley, for the fiscal year 1927, which he estimates have brought returns of \$3,000,000 for 1,250 acres of wheat and 7,500 cars of hay. In addition, he estimates as "by-products" of alfalfa hay, \$1,500,000 worth of cream, which is marketed annually through the creameries.

ON the Fraunie division, Shoshone project, 14,512 pounds of cream were shipped during the month, and on the Garland division the Castberg Creamery purchased 12,200 pounds of butterfat, manufacturing 13,700 pounds of butter and 1,600 gallons of ice cream. Other agencies purchased 3,464 pounds of butterfat.



## Economic Notes from the Irrigation Projects

### Salt River Irrigation Project Creates Railroad Tonnage

By T. A. Hayden, assistant engineer, Salt River Valley Water Users' Association

AN expenditure of \$15,600,000 was made by the Southern Pacific in 1925 and 1926 in building a new main line through Phoenix and the rich agricultural territory around it. This development was made in spite of the fact that this railroad already had a main line crossing southern Arizona nearly paralleling the new one, the distance between the two being not greater than 40 miles at the farthest point. A branch from the old road connects with Phoenix from Maricopa Junction, 35 miles distant. The apparent duplication of expenditure was made necessary by the enormous advancement in the development of the Salt River reclamation project under the great Roosevelt Dam. Where the old line traversed an unbroken stretch of arid desert, the new one for nearly 100 miles passes through one of the most highly developed agricultural communities in the world.

The total length of the new main line is 163.72 miles, not counting 18.31 miles of old main line double tracked. This is 42 miles longer than the old line, but grades and curvatures on the new line are enough better to practically offset the additional distance. Work was begun

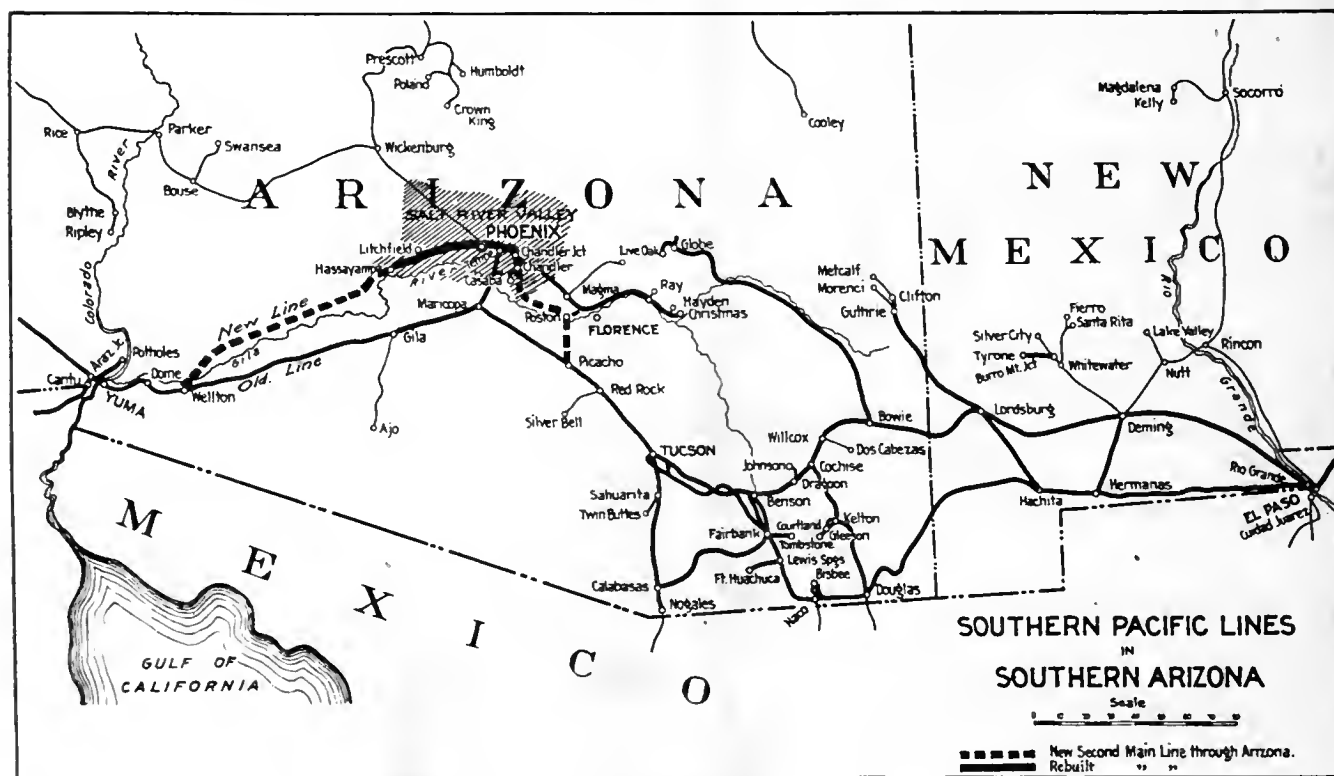
January 6, 1925, and the entire 164 miles was placed in service November 1, 1926. All through passenger traffic and the great bulk of freight now pass over the new line.

Construction involved the excavation of 2,700,000 cubic yards of earth, 510,000 cubic yards of cemented material, and 385,000 cubic yards of solid rock. The Gila River is crossed twice, one bridge being 5,000 feet long and the other 3,800 feet. Other major structures are the 4,700-foot bridge across the Agua Fria River and the 2,700-foot bridge over the Hassayampa River. The new line is 88 per cent tangent, one tangent alone being 40 miles in length. The maximum curvature is 3 degrees. The line is fenced throughout and heavily ballasted. Ninety-pound rails and 7 by 10 creosoted ties were used.

Prior to the building of this new line Phoenix and the Salt River Valley were served by a branch from both the Southern Pacific and the Santa Fe. It was inevitable that an agricultural area of nearly 400,000 acres of land, 240,000 acres of which are included in the Salt River project alone and served with water from Roosevelt Dam, should have

main-line service. Not only the vastly increased freight tonnage but also the great interest attached to the scenic, climatic, and other features of this area made it certain that sooner or later one of the great roads would build directly through this territory.

The Roosevelt Dam was begun by the United States Reclamation Service in 1906 and was completed in 1911. In November, 1917, the project was turned over to the Salt River Valley Water Users' Association, the farmers' organization comprised of water users under the project. Since that time the water users' association has built two additional dams on the Salt River below Roosevelt, mainly for the generation of hydroelectric power, and has increased the capacity of Roosevelt Reservoir by installing gates in the spillways. The original storage of 1,367,000 acre-feet has been increased by these developments to nearly 2,000,000 acre-feet while the total generating capacity of the project's hydroelectric plants has been increased to 84,000 horsepower. One of the dams mentioned, at Mormon Flat, was completed in 1925. The Horse Mesa Dam, 305 feet high from bed rock with coping and nearly 50 feet higher above



stream bed than Roosevelt Dam, has just been completed. The 7,000 farmers of the Salt River project have a gross income assured from the project power system under existing power contracts of more than \$2,000,000 a year. The total investment in project works aggregates \$25,000,000.

The gross annual returns from field crops alone on the project varies between \$16,000,000 and \$25,000,000, and for the entire area around Phoenix reaches as high as \$40,000,000. The development of more than 300,000 acres of irrigated land in addition to that now under cultivation is actually in progress in the vicinity. A fourth dam is proposed as an additional major power unit of the Salt River project on the Salt River at Stewart Mountain, about 10 miles below Mormon Flat Dam. When this is completed there will exist a string of four lakes stretching along the river for a distance of nearly 60 miles from the lowest dam to the head of the highest lake. Each of the upper dams stands with its foot in the water of the lake created by the dam next below it. Nothing in America exceeds this in scenic properties. The Southern Pacific operates a line of big automobile busses over the famous Apache Trail which traverses the rugged mountains surrounding these lakes. This area bids fair to rival Southern California and Florida as a winter playground, but in this case the tourist attractions have been developed only as an incidental to the creation of a prosperous farming community and a great hydroelectric power system.

Eight hundred rural homes in Salt River Valley are now equipped with electricity for domestic and farm use. The Stewart Mountain development will carry with it the construction of transmission lines for the electrification of every farm on the project. Maricopa County has 500 miles of concrete-paved roads representing an investment of more than \$10,000,000. Not a single farm is more than two miles from pavement. The community is developing with great rapidity from the standpoint of population as well as physical improvements. Phoenix has a population of 50,000 and that of the surrounding farm area is about the same. The visitor from the East with a previous conception of Arizona as an arid desert, has a decided surprise in store for him when he finds that he can drive for days through highly developed farm land green 12 months in the year and growing everything from cotton and alfalfa to citrus fruits and grapes.

It is no wonder that Salt River Valley is attracting to it such men as Frank O. Lowden, who, among others, recently purchased a farm and home there.



Southern Pacific main line crossing Gila River and serving Salt River project

## Thoroughbred Dairy Cattle for the North Platte Project

THREE carloads of thoroughbred Holstein cattle arrived in the North Platte Valley recently from Brighton, Colo., and have been distributed among various herds to aid in building up a better dairy stock and further the dairy industry in general. One car was left at Melbeta, one at Gering, and one at South Morrill. The 107 animals have been allotted in groups of two to four to a farm. The stock was imported through

the dairy finance corporation which was organized recently.

This makes three shipments which have come into the valley from the Brighton section in recent weeks. The first earload was sent to Henry, and later another shipment of two earloads, with 58 head, was sent to Minatare. Orders have been placed for 15 additional earloads. These are to come from Wisconsin herds, since the available stock at Brighton has been exhausted.

Eben S. Warner, Phil Rhee, and N. M. Lawritson will go to Wisconsin to purchase the stock that has been ordered. Mr. Lawritson has charge of the purchasing operations for the finance corporation. Mr. Rhee is cow tester for the county and active in building up the dairy industry.

It is hoped that with the fine, high grade stock added to the various herds the dairy industry in the valley will grow even faster than it has in past years, and that this section will out distance other famous dairy centers.

The Brighton district from which the recent shipment came is famed for its fine Holstein stock and for its output of dairy products. There are said to be 37,000 thoroughbred cattle in that immediate vicinity, with a cheese factory in operation there and a condensing plant only a short distance away, at Fort Lupton. The Brighton herds supply a large part of the dairy products and milk to Denver.

Governor Lowden is quoted as saying that he considers Salt River Valley the finest spot on the globe. Reclamation, based on a sound physical and economic foundation, is solely entitled to the credit for the creation of the most successful irrigation project in the world—a \$25,000,000 development that is paying for itself. This is literally true, since the power revenues of the project will not only pay all operation and maintenance costs, but, in addition, retire all capital-investment obligations.

The Southern Pacific did not require any special visionary powers to see the handwriting on the wall. It could not sit idly by and watch the growth of a great empire which its main line merely touched along the outer edge. Self-defense, as well as the desire to promote development, required that its line be located through the heart of the field. In this way it will reap the benefits of the improvement which it helps create.

## Klamath County Agricultural Economic Conference

**A**N exceedingly interesting bulletin is the report of the Klamath County Agricultural Conference, held at Klamath Falls, Oreg., February 9 and 10, 1927. The scope of the conference is indicated by the following chapter headings in the report: Boys' and girls' club report; dairy committee report; farm crops committee report; farm management and economics committee report; livestock committee report; poultry committee report; rabbit raising committee report; truck crops committee report; some facts about Klamath County agriculture. Every water user on the projects could reap some benefit from a perusal of this report, and certainly it should be in the hands of every water user on the Klamath project.

The Farm Management and Economics Committee report considers the present resources of the Klamath project from the standpoint of land utilization, available labor, available capital, and the selection of crop and livestock enterprises "in the hope that these resources may be utilized to the best advantage in adopting and developing profitable systems of farming in the district." Many analyses of existing conditions and pertinent suggestions are made by the committee from which the following are quoted:

From the analysis made the committee believes there are many farmers on the project who could materially increase their incomes by making minor adjustments in the organization of the farm. Some minor adjustment in the business may increase the returns, or in some cases it may be profitable to reorganize the farm completely.

The objective in the selection of a combination of enterprises is to obtain the greatest income for the labor of the farmer and his family, and for his investment. This may be accomplished in general by the adoption on individual farms of enterprise combinations which will accomplish the following results:

1. Employ to full capacity, the year round, all available labor on the farm.
2. Minimize the risk of one-crop farming.
3. Utilize all waste and by-products of the farm, as well as all fixed resources, such as buildings, labor, equipment.
4. Make possible a large gross volume of business.

In selecting the enterprise combinations for a particular farm the major enterprises should be supplemented by sufficient minor enterprises to utilize the remaining supply of labor. All enterprises should be in harmony with the collective interest of the district. The

following list of enterprise combinations will be found applicable to the respective types of individual farms on the project:

1. Major enterprises: Dairy and poultry. Minor enterprises: Potatoes, alfalfa, grain.
2. Major enterprises: Dairy farm, sheep. Minor enterprises: Alfalfa, hogs.
3. Major enterprises: Potatoes, alfalfa, clover. Minor enterprises: Farm, sheep, dairy, or poultry.
4. Major enterprises: Dairy, poultry, alfalfa.
5. Major enterprises: Farm, sheep, alfalfa, potatoes. Minor enterprises: Dairy, poultry, hogs.
6. Major enterprises: Range sheep or cattle, irrigated pasture, and alfalfa.

On each farm the plan should include production of enough alfalfa to meet requirements and sufficient irrigated pasture to supply farm needs. On all farms livestock should be kept to supply fertility and to maintain a steady income the year around. A good home garden should be produced to supply family needs.

The committee makes the following pertinent remarks concerning credit:

The present sources of credit to farmers are as follows:

1. Charge accounts at stores.
2. Local banks.
3. Federal farm loan association.
4. Joint-stock land bank.
5. Private loan companies.

6. World War Veterans' State Aid Commission.

It is the belief of the committee that farmers in general could strengthen their credit in the following manner:

1. File a credit statement based on farm accounts kept by farmers.
2. Talk plans over with banker.
3. Borrow only for production purposes.
4. Pay cash and obtain discount.
5. Work out with existing agencies a plan properly to fund the farm business on a long-time loan basis.
6. Live within income.

It is the belief of the committee that in general bankers are in position to render great service to the community and especially to farmers:

1. By recognizing farming as the ultimate base of prosperity.
2. By keeping in close touch with farm conditions and the farmers' problems.
3. By making farmers' notes, in so far as possible, correspond to time of growing crop.

The members of the farm management and economics committee were as follows: U. E. Reeder, chairman, Pine Grove; G. J. Hilyard, Klamath Falls; R. E. Geary, Klamath Falls; A. C. Cooley, Salt Lake City; J. W. Kerns, Klamath Falls; Leslie Rogers, Klamath Falls; L. P. Sabin, Klamath Falls; and R. S. Besse, secretary, Oregon Agricultural College.

## Irrigated Crop Rotations in Western Nebraska Studied

**T**HE value of crop rotation on irrigated lands in western Nebraska is indicated by a series of experiments conducted under the direction of the United States Department of Agriculture at the Scotts Bluff Field Station, results of which are reported in Technical Bulletin 2-T, *Irrigated Crop Rotations in Western Nebraska*, issued recently by the department.

The experiments included the more important field crops of the region and were so arranged as to afford comparisons as to yield between continuous cropping and simple rotations, and between simple rotations and rotations to which manure was applied or in which alfalfa was included.

With oats the yields from simple rotations have not been much larger than from continuous cropping. The use of manure or alfalfa in the rotation has given substantial increases in yield, and of these two treatments alfalfa has been the better.

With potatoes the yields from the untreated rotations have been larger than from continuous cropping, though the

differences have been less during the last five years than during the longer period. Both manuring and the use of alfalfa have given marked increases in yield, with the increases from alfalfa much larger than those from manuring. The crops from the alfalfa rotations have also been less injured by scab than those from the other rotations.

It appears that corn grown in rotation with other crops gives better yields than when grown continuously on the same land. When grown in a rotation where it follows three years of alfalfa the yields are very satisfactory and appear to be increasing with the progress of the experiments.

A summary of five comparisons involving manure and seven comparisons involving alfalfa shows that by devoting the land to alfalfa for two or three years in each rotation the increased yields are substantially the same as those obtained from an application of manure at the rate of 12 tons per acre.

A copy of the bulletin may be obtained by writing to the United States Department of Agriculture, Washington, D. C.

## Ten-Year Crop Value One Billion Dollars

The gross value of crops grown during the last 10 years on land irrigated from works constructed by the Bureau of Reclamation amounted to more than \$1,000,000,000.

A tabulation recently prepared shows the cropped acreage, value of crops, and the average value of crops per acre for each of the years 1917 to 1926, inclusive. In 1917 the cropped area was 966,784 acres and the value of the crops \$56,462,000. Since then there has been a gradual but steady increase in the cropped area, until in 1926 the area was 2,264,600 acres, and the value of the crops \$109,118,300. The yearly value of crops fluctuated

widely during the 10-year period, owing to conditions created by the World War. These values reached their peak in 1919, totaling \$152,978,890.

The average acre value of crops for the 10-year period was \$53.42, which is far greater than the acre value of crops in the United States as a whole. Statistics show that during the 10-year period the average value of the 10 leading crops in the United States, which represent nearly 90 per cent of the total area of crops, ranged from \$14.45 to \$35.74. The high area average on reclamation projects is the result of an adequate water supply and improvements and cultivation above the

average. The State of Washington, in which the Yakima and Okanogan projects are located, showed the highest per-acre value of crops during the 10-year period, ranging from \$77.30 to \$385. In contrast, the lowest per-acre value is shown in Montana, where the Huntley, Milk River, Sun River, and Lower Yellowstone projects are located, ranging from only \$8.06 to \$49.14. These statistics furnish a striking indication of the part Federal irrigation has played in building up a self-supporting population on what were desert solitudes and creating a satisfactory economic life on the land.

### Irrigated Crops Worth \$60,664,900

One-third of the cropped acreage on the Federal irrigation projects in 1926 was in alfalfa and more than half the acreage in hay and forage crops, according to crop data recently compiled by the Bureau of Reclamation, Department of the Interior. The value of the 1,291,300-ton alfalfa crop was \$11,639,000, or nearly one-fifth of the total value of all crops. About one-fourth of the total value is represented by all hay and forage crops.

Cotton was grown on 209,850 acres on five projects, producing 165,670 bales of 500 pounds each, and 76,800 tons of seed, the two products being valued at \$13,625,000, or 22½ per cent of the total value of all crops.

Other crops valued at more than \$1,000,000 each were corn (\$1,056,500); wheat (\$4,219,000); onions (\$1,354,000); white potatoes (\$5,961,000); garden truck (\$5,664,000); apples (\$2,570,000); citrus fruit (\$1,053,600); and sugar beets (\$4,512,600).

The total cropped area was 1,361,470 acres, producing crops valued at \$60,664,900, or \$44.56 per acre.

### Tieton Growers Have Fine Crops

The Yakima Morning Herald, in a recent article, sizes up the crop situation on the Tieton division of the Yakima project, Washington, as follows:

With a good pear crop and a 100 per cent apple crop in sight Tieton growers are looking forward to the opening prices with complacency.

### Is Yakima Prosperous?

The answer to the above question is found in the following 11 reasons why Yakima Valley residents have reason to be happier than usual, as printed in a recent issue of the Yakima Valley Progress:

1. From 10,000 to 11,000 cars of apples with one of the shortest national crops in 20 years and only a 46 per cent crop in the United States.

2. A potato tonnage increased from 8,000 cars to at least 9,000 and possibly 12,000 cars.

3. Substantial soft fruit crops with high prices.

4. The taking of long-time leases upon business property totaling hundreds of thousands of dollars.

5. Establishment of numerous new business houses and many changes and enlargements.

6. City building permits amounting to \$563,385 during the past six months.

7. City bank deposits \$94,153 greater than last June 30. Total deposits are \$10,078,000.

8. Announcement by the Federal Government that its program calls for the spending of \$25,000,000 in the Yakima Valley toward placing water on arid lands during the next 10 years.

9. An adequate water supply for all crops, 611,000 acre-feet in storage.

10. A school building program for the county totaling \$578,000 with like activity being carried on by the churches.

11. An increase of 6 per cent in the county school census. Total now 23,193.

A canvass of the situation made recently indicates that they are expecting \$2 a box for their pears and holding for \$2 a box for their Jonathans.

### Reclamation Project Livestock Inventory

A recent inventory of live stock and farming equipment on the Federal irrigation projects shows a total value of \$32,515,900, an increase over the preceding year of \$2,086,200. Livestock was valued at \$20,391,100 and equipment at \$12,124,800. Horses and mules numbered nearly 90,000 and were valued at almost \$5,000,000. The 67,000 beef cattle were valued at \$2,398,800 and the 112,250 dairy cattle at \$7,447,200. The projects reported 274,700 sheep valued at \$2,323,100; 92,260 hogs at \$1,215,000; 1,844,300 chickens, turkeys, ducks, and geese at \$1,894,000; and 37,870 hives of bees valued at \$246,450.

The largest livestock value, amounting to \$3,423,600, was found on the Salt River project, Arizona. Other projects reporting livestock valued at more than a million dollars each are the Boise and Minidoka projects, Idaho; North Platte project, Nebraska-Wyoming; Newlands project, Nevada; Rio Grande project, New Mexico-Texas; Strawberry Valley project, Utah; and Yakima project, Washington.

Pears will be ready to come off the trees about August 20 according to recent estimates. Apples are making a good growth and are beginning to show color. In many places props are being placed to help the trees bear the loads. The apple crop will be a record one for the district, in quantity, size, and color, it is predicted, and growers feel that they can demand the best the market has to offer.



## Engineering Board Studies Owyhee, Deadwood, and Gibson Dams

*A. J. Wiley, D. C. Henny, and W. H. Nalder constitute board*

A BOARD of consulting engineers has been appointed for the purpose of considering and reporting upon various matters in connection with the design and construction of three large dams planned for early construction or already under way by the Bureau of Reclamation, as follows: Owyhee Dam in Oregon, Deadwood Dam in Idaho, and Gibson Dam in Montana.

The members of this board are: A. J. Wiley, of Boise, Idaho; D. C. Henny, of Portland, Oreg.; and W. H. Nalder, of the Denver office of the Bureau of Reclamation. Associated with these in the consideration of the respective dam sites will be the following: At Owyhee, F. A. Banks, construction engineer; at Deadwood, R. J. Newell, project superintendent, Boise project; and at Gibson,

George O. Sanford, project superintendent Sun River project, and Ralph Lowry, construction engineer.

The Owyhee Dam is to be located in a canyon section of the Owyhee River about 20 miles above its mouth and will have a total height from foundation to parapets of 360 feet, making it 11 feet higher than the world's highest existing dam, namely, Arrowrock, completed by the Bureau of Reclamation in 1915. Owyhee Dam will provide a storage capacity of 595,000 acre-feet of water, to be used for the irrigation of 124,000 acres of land, a portion of which is now afforded a partial water supply from the Owyhee and Snake Rivers.

The problems to be considered by the engineering board in connection with the Owyhee Dam are outlined by Chief Engineer R. F. Walter, of the Bureau of Reclamation, as follows:

(a) Suitability of the site for a dam of the proposed magnitude in view of the foundation conditions as disclosed by geological reports and drilling and testing at the dam site.

(b) Additional foundation exploration not now definitely contemplated that should be performed before final designs for the dam and related works are prepared.

(c) Best approximate position for the dam, taking into consideration all features including the probable future construction of a plant for the development of electric power.

(d) General type of dam most suitable for the conditions to be met. It is anticipated that a definite recommendation can be made at this time as regards the choice between the arch dam and the gravity dam. In the event an arch dam is recommended, further study will be necessary before decision is made regarding the type of arch, and this decision can await later consideration by the board members.

(e) Recommended controlling stresses to be permitted in the detailed design of the dam.

(f) Source of concrete aggregates to be used, particularly as to the choice between shipped-in and manufactured aggregates, taking into consideration the transportation and construction conditions. Final decision in this matter, especially as to the choice between the sources of shipped-in material, will be affected by the results of tests not yet completed.

Dr. Warren H. Smith, geologist, of Eugene, Oreg., has been appointed as a consulting geologist to examine and advise as to the geological conditions disclosed by the recent diamond drilling. It is expected that he will make his examinations of the field conditions immediately in advance of the meeting of the board, and it is hoped that he will



Owyhee dam site. It is about 400 feet from the water to the top of the first cliff on the left and about 800 feet to the main land table



be present at the time the board meets to give advice.

Deadwood dam is planned to raise the water surface of the Deadwood River, a tributary of the Payette, 113 feet, forming a reservoir with a storage capacity of 101,000 acre-feet, to provide storage for the Black Canyon division of the Boise project and adjacent lands. Estimates have been prepared for two types of dam, a concrete arch and an earth and rock fill embankment. The principal duty of the engineering board will be to advise as to the more suitable of these two types.

The points to be considered by the board at this site are outlined as follows:

(a) Availability of suitable sand and gravel for concrete construction. In this the question of the amount of such material that is available is believed to be of great importance. It is estimated that a concrete arch dam of the required height will contain not to exceed 65,000 cubic yards of concrete.

(b) The availability of sufficient suitable material for an earth and rock fill embankment as an alternative to a concrete masonry dam. It has been estimated that such an embankment would require about 313,000 cubic yards of clay, sand, and gravel material and about 140,000 cubic yards of rock-fill material.

(c) Foundation conditions as disclosed by test pits and surface conditions and the effect of these foundation conditions on the type of dam to be built.

(d) Effect of the short construction season and the long haul for construction materials on the type of construction to be adopted.

Gibson dam, contract for the construction of which has been awarded to the Utah Construction Co., will be of the massive concrete arch type with a maximum height of 195 feet and a crest length of 900 feet. It will store 90,000 acre-feet



Frame for tying reinforcing bars at joints, Main Canal, Kittitas division, Yakima project, Wash.

for the irrigation of lands on the Sun River project of the Bureau of Reclamation. Excavation for the base of the dam and the spillway was begun by the contractor in December, 1926, and has progressed to a point where it is desired to start concreting in a short time.

The matters to be given consideration here by the engineering board have to do with the suitability of foundation conditions as now exposed, the extent of additional work to be done on the foundations before concreting is begun, the suitability of the contractor's plant for producing from the available materials uniform concrete of the required strength and durability, and the precautions that must be exercised by the construction engineer to

insure the best quality of concrete in the structure. The work that has been done for the foundation grouting is also to be considered and any advisable changes outlined.

## Peruvian Conditions For Colonization

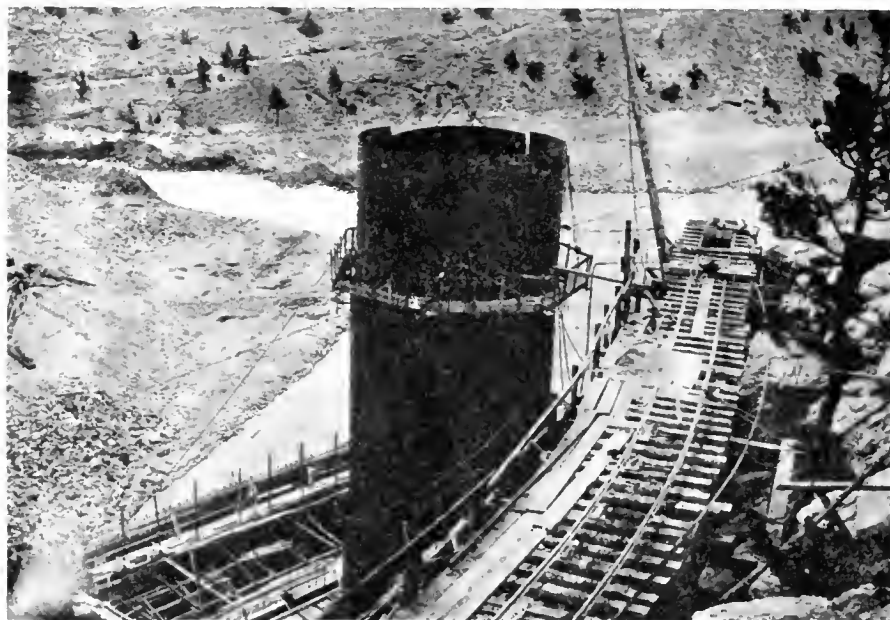
A recent issue of the bulletin of the Pan Pacific Union states that in order to determine the advantages which will be granted to national or foreign colonists settling in the mountainous region of Peru the Chief Executive recently published a decree setting forth the terms that will be given them as follows: Ten hectares of land will be granted to each individual settler and 30 to every family. During the first six months a daily allowance of 1 sol will be made to each adult colonist and of 50 centavos to every child under 15 years of age. The colonists will receive free medical care. The Government will provide transportation for them from the port of Callao to their ultimate destination. Agricultural tools and seeds for planting will also be supplied by the Government. The price of the tools, seeds, and transportation shall be refunded to the Government when, in the opinion of the Administration of Colonization and Immigration, the colonist, through the development of his crops, is able to do so. The colonist shall engage to contribute toward the development of a town, having the option of a lot in said town 50 meters deep by 40 in width, whereon to construct a house. (One hectare equals 2.47 acres; one sol equals \$0.487 at par.)



Gibson dam site, Sun River project, Mont., showing excavated foundation on south abutment

# The Guernsey Surge Tank, North Platte Project, Nebraska-Wyoming

By R. E. Glover, Associate Engineer, Denver Office



Guernsey surge tank during construction. Workmen on inside were supported on a floating platform.

THE Guernsey surge tank is one of the vital elements of the Guernsey power plant, the first unit of which has recently been placed in operation. This plant develops power from water released from the Guernsey reservoir, and together with the Lingle plant supplies power for industrial, municipal, and project uses in the territory along the North Platte River in eastern Wyoming and western Nebraska.

The location of the plant at the outlet of a reservoir whose primary purpose is for the storage of irrigation water, makes it necessary to operate under widely varying heads. The use of power by various flour mills and for domestic lighting makes it necessary to hold the frequency and voltage fluctuations within narrow limits. Power is supplied for industrial uses to motor units as large as 800 horsepower, whose intermittent use causes heavy load fluctuations. Water-power plants are inherently difficult to regulate, so that the exacting requirements in this case gave rise to a problem in turbine regulation of unusual interest.

The Guernsey plant is supplied with water through approximately 170 feet of 25-foot horseshoe tunnel connecting with 700 feet of 12-foot circular tunnel. About 5,200 tons of water are inclosed within this conduit, and this great mass must be accelerated or checked each time the load on the turbines increases or falls off. The turbine gates are controlled by a sensitive mechanism which opens the

gates if the speed of the turbine drops, or closes the gates if the speed rises above a predetermined value. If the turbines were connected directly to the power tunnel and an increase of load caused the speed of the units to drop, the governor would react by opening the gates. Under this condition the head required to accelerate the water in the tunnel to its new velocity would be taken from the effective head on the turbine, and the first result of a demand for extra power is an actual falling off of the output of the turbine. On a decrease of load the converse is true, in that the closing of the turbine gates causes the pressure to rise, and the first result is an increase in the power output of the turbine. To gain an idea of the magnitude of the transient power deficiency for this plant, a computation was made on the basis of an instantaneous load addition of 1,360 horsepower, or 20 per cent of the full load capacity of the completed plant. The calculation showed that the power supply would be deficient for nearly eight seconds with an accumulated deficiency of 27,000,000 foot-pounds of energy. This is a somewhat greater load change than is expected, but the computation shows that a fly-wheel some sixty times as large as could be obtained would be necessary to provide satisfactory service. The need for shortening the distance from the turbines to a free-water surface, as well as the necessity for limiting the pressure rise following a release of load to what could be

safely borne by the power tunnel, made the installation of a surge tank imperative.

As finally designed, the surge chamber is a steel tank 85 feet high with a uniform inside diameter of 22 feet and rests directly on the concrete anchor at the junction of the power tunnel and the penstocks. This arrangement is mutually beneficial since the anchor not only supports the surge tank but the surge tank and the water it contains provides a large proportion of the weight necessary to insure the security of the anchor. The uniform diameter from top to bottom is necessary both to provide the required area throughout the total range of head and to shorten the effective penstock length as much as possible. The resulting appearance is somewhat unusual and is said to have caused one engineer to remark that "the Guernsey plant is the only water power plant in the world with a smokestack."

The proportioning of such a tank so that it will properly perform all its functions and at the same time be as economical of material as possible is no small undertaking in itself, since the mathematics is very much involved. The fundamental physical relations governing the action of surge tanks are expressible in two parametric differential equations of the first order, involving the three variables—tunnel velocity, departure of water surface from the normal level in the surge tank, and time. These equations are of peculiar interest to the mathematician since they apparently belong to that class of equations for which no general solution is known. For any particular case, a close approximation to the correct solution may be found by applying the original equations successively over small increments of time. This method is laborious in the extreme and is made doubly so because the desired dimensions can not be solved for directly but must be found by cut and try.

The mathematical difficulty is due to the fact that the frictional resistance to the flow of water is proportional to the square of its velocity, since if the assumption be made (at the expense of accuracy) that the resistance is proportional to the first power of the velocity the equations become manageable and if the frictional resistance be neglected entirely they are easily solvable. The simplicity of the formulas derived on the above bases and the known fact that they give, or can be made to give, results on the safe side, have gained them a wide acceptance among engineers. This is especially true

in the case of the formulas derived by neglecting the friction entirely, because by their use the size of tank required can be solved for directly. It is also usually possible to design the penstock and connection so that the condition of negligible friction assumed is substantially justified in fact, it being highly desirable to reduce friction in the flow line in any case to save power.

It has come about, therefore, that the peculiar mathematical difficulties have caused an important point to be obscured, which is, that friction properly employed may here be turned from a liability into an asset, and may be used not only to decidedly decrease the size of tank required but to improve its operation. These two desirable features are secured in this case, not by increasing the friction to flow in the power tunnel or penstocks but by throttling the connection between penstock and surge tank sufficiently to introduce a calculated amount of resistance to flow. This resistance does not interfere in the least with the normal operation of the turbines, but does materially reduce the amplitude and duration of the surges caused by changes of load. An experienced turbine manufacturer recommended a tank of 35 feet diameter for this installation, based presnably on the accepted formulas and practice. A comparison of the 35-foot open tank with the 22-foot throttled tank shows the profound effect of providing resistance to flow in the surge tank connection. In this case it is provided by bolting an annular ring to the top of the connection to the surge tank, thereby restricting the area through which the water must pass on entering or leaving the tank.

## Argentine Land Settlement

An item in a recent issue of the *Timberman* states that representatives of the principal railway companies in Argentina have been in conference with Doctor De Alvear, President of the Republic, to discuss ways and means of putting into practice an important railway land settlement plan. The scheme is to have a Government concern working with the support of private capital. It was stated that 10 railway companies concerned would set aside \$1,650,000 each for land-settlement purposes. The idea of inducing Italian, Hungarian, Austrian, Spanish, and German settlers was discussed. The working basis of the plan is the fostering of agricultural progress in the regions served by the railway lines. A joint organization, to be known as the Railways Colonization Consortium, is to be formed to take charge of the lands received for that purpose.

## Farm Electrification in California

*From Review of the Pacific*

A STRIKING contrast to the rest of the United States is presented by the progress of agricultural electrification in California, where more electricity is used on farms than in all other States combined. Of the power used for agricultural purposes in this State, 42 per cent is electrical and only 18 per cent is furnished by work animals, as compared to 5½ per cent and 60 per cent for the country as a whole, and about 60 per cent of California farm homes have electric lights and running water. Each farm worker in this State utilizes over three times as much power as the average for the United States, and for every hour of human labor used on California farms 1½ horsepower hours are similarly employed. Advocates of agricultural electrification point to the fact that the average net income of the California farmer is larger than that of farmers in any other State and over twice the average for the United States.

### FARMERS ENJOY LOW POWER RATES

The extensive employment of electricity for power purposes on California farms has been made possible by a number of factors that have made the rate for electricity in rural districts only one-half that in other States. In the United States as a whole, 70 per cent of the electricity is generated by steam plants, which are usually situated in the large cities in which most of the power is used.

In California, on the other hand, because the high mountains and rapid streams provide an easy means of obtaining power, 80 per cent of the electricity comes from this source and must be transmitted from the ranges in the eastern part of the State to the cities on the western coast. Consequently, on its journey from the generating to the receiving station, electricity must be carried across the large valleys where most of California's crops are grown and is thus available in farming districts.

The second reason for the progress of agricultural electrification in this State is the extensive acreage under irrigation, which is more than 20 per cent of the total irrigated area of the United States. Although about half this area is watered by gravity flow, this method is limited in capacity and distribution and there are about 2,000,000 irrigated acres in

California requiring water pumped from rivers or wells. Wherever electricity is available electric motors, because of their ease of operation and maintenance, have replaced gasoline engines or other forms of power for pumping. These operations consume 80 per cent of the electricity used for agricultural purposes in California and provide the major or base load, making it possible for power companies to extend their lines in rural districts.

Still another cause for the low rates for electric service on farms in California, as compared with other States, is the local power companies' policy of placing some of the cost of rural distribution on urban consumers, who ultimately benefit by the subsequent agricultural development.

## Drainage by Pumping on Boise Project

Much interest has been aroused on the Boise project in the question of drainage by pumping in the valley by a local engineer and a well-sinking firm. Districts with less than an ample water right and with areas seeped from irrigation on higher lands have been especially singled out. An initial contract has been signed between the Pioneer irrigation district and the company which sinks the wells for one well in the edge of Nampa to discharge directly into the Phyllis Canal. The basis of payment is to be \$30 per inch for the yield of the well with a maximum draw-down of 35 feet. It is understood to be the plan to sink a hole 36 inches in diameter and pack the space around it with screened gravel.

## Rio Grande Project Plans Exposition

It is understood that instead of a county fair this fall the Rio Grande project, New Mexico-Texas, will hold a project exposition from October 19 to 22. Plans are being made to have exhibits from both the upper and lower valleys. The El Paso County Farm Bureau will join Las Cruces and Dona Ana Counties in preparing for and carrying out the exposition. Committees are busy preparing a premium list which they expect to have completed shortly.



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



Good business methods in handling crops on irrigation projects afford good homes

### Cooperation

It ain't the guns nor armament nor the funds that they can pay,

But close cooperation that makes them win the day;  
It ain't the individual, nor the army as a whole,  
But the everlasting teamwork of ev'ry bloomin' soul.

—Rudyard Kipling.

**W**HAT meager results we often obtain by working singly as compared to joining our efforts with those of others!

This applies with equal force to each activity in farming operations, as evidenced by the "network" of cooperative organizations operating in this and in foreign countries.

Research into this subject discloses the fact that co-ops exist to such an extent that even an exhaustive survey did not reveal them all. They are organized along lines of every conceivable movement of products.

Cooperative marketing organizations assist materially in the standardization of a product, in improving grading and packing methods, and, as increased production warrants it, broadens out into bigger fields.

Judicious advertising plays no small part in creating a greater demand not only of specific commodities but certain grades; and once a reputation is established for select qualities the demand increases, prices are stabilized, and success of the association is practically assured, if these

factors which constitute success are jealously guarded.

Trade names should be properly protected so that there may be no infringements after a demand is created.

One of the outstanding advantages of a cooperative association is the placing of the marketing problem in the hands of experienced men, selected as officers of the association, whose business it is to keep posted on the best methods to employ in the handling of the product to be marketed, on market prices, develop new and broader markets, and relieve the farmer of this worry. He is then free to devote his undivided attention to the production of a good crop that will represent both quantity and quality.

Experience has shown that a successful cooperative marketing association must be founded on a special industry.

### Making the Most of the Farm Products

Food, textiles, and other materials used in every home are produced on farms. It is becoming increasingly apparent that the success of agriculture does not rest solely on efficient production and distribution. There must be a closer fit between consumption and production. This means that American home makers

must know how to make the best use of the commodities supplied by farms.

Statistics at Washington show that there is a widespread desire for scientific facts on home making. It comes both from home makers and from the agencies that produce and handle the materials the home requires.

Volume production figures show that this country has an abundance of food, yet undernourishment is prevalent. Food habits are being studied to find out whether the difficulty is geographic, economic, or due to lack of knowledge of the simple facts of nutrition.

Many of the fundamental principles of nutrition are not being applied in everyday diets because they have not been translated into forms that can be used by the home maker. Figures on food composition must be compiled and kept up to date, since these are the basic terms used in translating nutrition facts. The close relation between vitamins and health is increasingly emphasized. Vitamin studies must follow to find out in which of the foods these are present and how they are affected by various methods of handling.

A nation-wide study is being made of the factors affecting quality and palatability of meat. Lamb and beef cuts from experimentally fed and slaughtered animals have been cooked by standard methods ready for judging. The results of this long-time study will be a guide toward methods of producing the most desirable types of market meat. Also it will yield many more facts on cooking meats so as to conserve and develop flavor, tenderness, juiciness, and food value.

Home canning of fruits and vegetables, use of soft-wheat flours, vegetable cookery and various other food problems are handled also from the standpoint of sound home and agricultural economy. The whole program aims at teaching the housewife to buy health for the family through properly selected and prepared foods.

### Why Sweets are Harmful to Children's Teeth

Sweets may be harmful to children's teeth in two very different ways. In the first place, children who have the habit of eating a great deal of sweet in the form of large amounts of sugar on cereals, or as desserts, or as candy between meals, are very likely not to get the building foods



they need. Children who have acquired a taste for candy and sweets are not so fond of cereals, eggs, milk, and simple vegetable dishes which are not highly seasoned. These foods are very necessary in the diet, because of the calcium they contain. The calcium builds good health and good teeth.

In the second place, children who eat sweets may have acid saliva in the mouth, caused by slight fermentation of the sugar in solution around the teeth. In time, this acid saliva tends to affect the enamel covering of the teeth. Furthermore, sugar in the mouth serves as a good food for bacteria which are normally present in the mouth. As the bacteria multiply in number, the chances for decay increase. Recent knowledge of mouth hygiene indicates, however, that poor diet has by far the greatest influence on poor teeth.

### *Trees Suitable for Roadside Planting*

Oaks are more generally useful for roadside planting than any other kind of tree. There are species of this tree native to nearly all parts of the country. Maples are next in importance for a large part of the country, but as the most-used species are not well adapted for the purpose, the selection must be carefully made.

The most promising trees for the cooler dry regions are the green ash, black locust, hackberry, thornless honeylocust, and poplars, with boxelder, willows, and poplars for the extremes of cold and drought. In warm dry climates the eucalypts or gums, the palms, the Jerusalem thorn, and the mesquite are good.

Success in roadside tree planting depends on properly locating the plants along the highway, selecting suitable varieties, and adequately protecting them from thoughtless persons, roving stock, and insects and diseases.

The best effects in roadside planting are usually produced by giving the predominant place to the common plants of the neighborhood, using introduced plants in subordinate positions. Next in desirability are plants from regions having similar growing conditions either in this country or abroad.

OF a total of 5,257 acres, appraised at \$148,257, consisting of 41 parcels of right of way to be purchased for right of way for the Owyhee reservoir, Owyhee project, contracts have been negotiated for 28 parcels totaling 3,408 acres with a total value of \$109,410. None of the contracts had been approved at the end of the month.



Cantaloupes are usually money makers on the irrigation projects

### *Irrigation and Drainage Prevent Alkali Deposits*

THE so-called alkali problem on irrigated lands can be prevented or remedied by an adequate system of drainage and the use of enough irrigation water to leach the root zone of the soil, according to Carl S. Seofield, in charge of western irrigation agriculture, United States Department of Agriculture.

Irrigation water always contains some salts, sometimes rather large quantities. When the water is taken from the soil by the plants or lost by evaporation the salts are left in the soil. If the water never penetrates below the root zone, the salts are left in that zone. Continued irrigation deposits more salt and finally makes the solution in the root zone so salty that plants can not absorb water from it.

The only way to prevent the accumulation of salt in the root zone is by applying more water than is needed by the plants for growth, thus leaching the salt from the root zone and carrying it below the danger point. It is not necessary to leach the root zone continuously or that more than a small amount of the water should pass out below. But it is essential to the sustained productivity of irrigated land that the root zone be leached to some extent at least occasionally.

It would not be difficult to solve the problem in this way if all soils were

readily permeable to the movement of water. In many irrigated sections the presence in the subsoil of bars or dykes of tight or cemented material interferes with the free movement of excess water in the direction of natural drainage outlets. In such cases it becomes necessary to cut artificial channels through these barriers to afford relief. These artificial channels may be open ditches or covered lines of tile. Much of the trouble from excess salt can thus be overcome by a system of irrigation and of drainage that insures a periodical leaching of the root zone, and that is designed to remove excess salt from the land as well as excess water.

LAND classification on the Vale project is being carried on by the Oregon State Reclamation Commission to determine the amount of unproductive land in the Warnsprings district and to arrive at an adjustment basis of settlement between the district and the bondholders.

CONSTRUCTION has been started by the Farmers' Cooperative Association on a new cotton gin in the upper end of the Valley division, Yuma project.



## Contract with the Black Canyon Irrigation District for Construction of the Payette Division of the Boise Project

IN the years immediately succeeding the passage of the reclamation act, the Federal irrigation project in the vicinity of Boise, Idaho, was designated the "Payette-Boise project," since it contemplated the irrigation of lands in both the Boise and Payette River valleys. However, the development in the Boise Valley was the first undertaken and the project later became known as the Boise project.

The land in the Payette Valley was generally unentered when the Government project was initiated, but under the stimulus of Government construction the land was soon taken up under the land laws. The amount of Government funds available was not sufficient to permit the simultaneous construction of irrigation works in both valleys, and the entrymen and owners of lands in the Payette division, becoming impatient with the delay in reclaiming their lands, petitioned that the Payette lands be no longer considered a part of the Government project, in order that such lands might be irrigated under private auspices. The Government granted this request and abandoned at that time the plans for the irrigation of the Payette lands.

However, private development did not prove a success, and in the Interior Department appropriation act approved January 12, 1927, there was appropriated under the heading "Bureau of Reclamation" \$400,000 for "continuation of

investigation and construction, Payette division," Boise project.

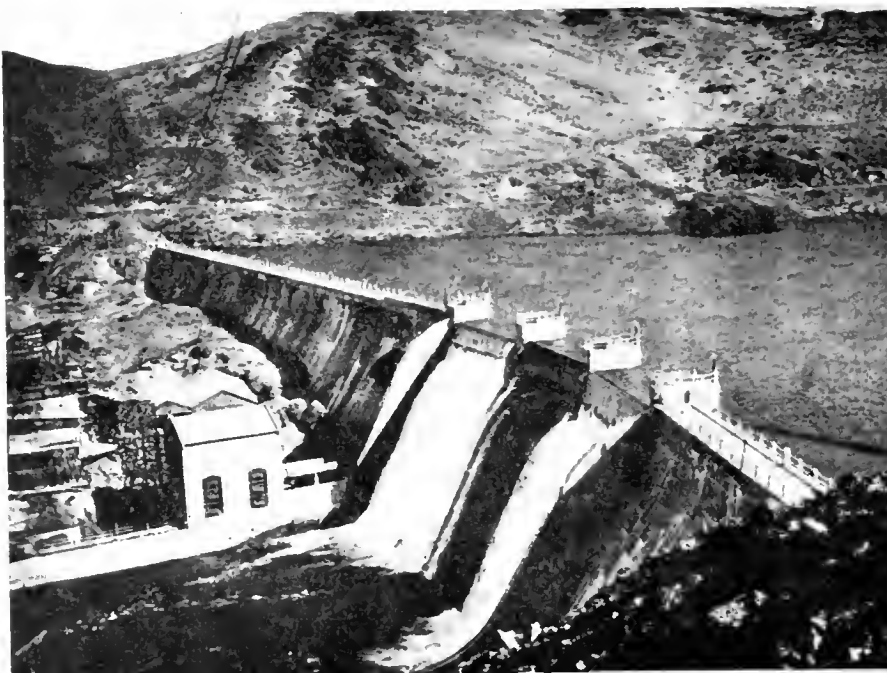
On July 27, the First Assistant Secretary of the Interior approved a form of contract to be entered into with the Black Canyon Irrigation District by which the district will pay the cost incurred by the United States in constructing the Payette division, sometimes called the Black Canyon division. There are, it is now estimated, about 56,000 acres of irrigable land under the proposed works, which are: (a) The Black Canyon Dam, already constructed, which will be used as the diversion dam, and a proportionate part of the cost of which the district is to pay; (b) a reservoir or reservoirs with capacity of from 100,000 to 175,000 acre-feet, to be constructed by the United States on the Payette River or its tributaries; (c) a canal system for diverting water at Black Canyon Dam and conveying same to the lands of the divisions; (d) certain pumping plants for irrigating land above the canals and (e) the Black Canyon power plant or an interest therein to supply the power needed for such pumping. The United States is to expend a maximum of \$1,500,000 for the construction of new reservoirs and a maximum of \$5,500,000 for the proposed canal system, drains, etc. The district is to repay such expenditures and \$715,000 for the use of the Black Canyon Dam as a diversion dam and a maximum of \$445,000 for the use of the existing pumping plant.

The district is to pay the construction charge in 39 annual installments, without interest. The last 34 installments are to be equal, but the Secretary has the option to make the first five installments smaller.

The district is to make the necessary levies in order to meet these installments as they come due and is to pay the amount due irrespective of default of some of the water users in meeting the assessments on their land, the district thus assuming what the water users usually refer to as "joint liability." The United States has the power to refuse delivery of water to the district in the event of default for a period of 12 months or more in making payments due to the United States.

Speculation has been the bane of many irrigation projects, the land being sold at progressively higher prices in advance of the time when water is ready for delivery. The result of making the irrigable area of a project the football of speculation is almost always harmful. By the time water is ready for delivery, the land is found in the hands of a disappointed speculator who has bargained to pay much more than it is worth and who does not desire to farm but to sell again at a profit. He has bought on a slender "margin," giving a mortgage for the remainder of the purchase price, and he is always in doubt whether to throw up the sponge or to hold on, which latter means, of course, to undertake the expense of leveling the land for irrigation, meeting the water charges, planting crops, and building houses and other improvements. He is generally the victim of a speculative fever, since there is at the present time in the West very little value in raw irrigable land, the value it has under irrigation being due to the cost of the water supply, and to the expense which the landowner must undergo to level his land and subdue it for irrigation.

Article 35 of the contract attempts to reach the heart of the problem by providing an appraisal in the county recorder's office showing the value which disinterested appraisers have given the land after a careful investigation, and by requiring that all sales in excess of the appraised price shall be reported, the excess price received being divided equally with the project. In this manner sales of land at excessive prices are not forbidden, but if such sales are made the land concerned is to receive payments on the water charges to be due therefrom to the extent of one-half of the excess of the sale price over the appraised valuation. The landowners are to agree to these con-



Black Canyon Dam, Boise project, Idaho.

ditions, and the contract contains the following provisions:

The United States shall not be obligated to make any expenditures for storage construction in pursuance of this contract until the owners of at least 60 per cent of the total area of all entered land or patented lands in the Payette division susceptible of irrigation from the works to be constructed hereunder shall have executed, for themselves and successors in interest, recordable contracts in a form approved by the Secretary, accepting and agreeing to the terms of this contract, and particularly of this article. The United States shall not be obligated to make any expenditures for the construction of a distribution system hereunder until at least 80 per cent of the said lands shall have been so obligated. No water shall be supplied to any lands until such contracts shall have been executed by the owners thereof.

Congress, in the reclamation laws, has repeatedly manifested a determination that water is not to be furnished to lands in private ownership exceeding the area sufficient to support a family and in any event to more than 160 acres in one ownership. It manifestly would be improper for public funds to be used for the enrichment of a few large landowners. The contract enforces the law relative to large holdings by providing for an appraisal of land in large holdings, for the selection by the owner of the 160 acres he desires to retain, and for the sale of the remainder at or below the appraised price. The owners of such land are to execute recordable contracts binding the land to the requirements of the law and of the contract with the irrigation district. If a large landowner refuses to sign such contract, he is not entitled to receive water although his land is nevertheless to be assessable for the project charges. The large landowner has three years after water is ready for delivery to his land within which to dispose of his excess property by sales at or below the appraised price. If he fails to dispose of the excess land within this period, the Secretary is empowered to order the land into the market and sell it at such price as may be obtained therefor.

## Uncompahgre Poultry Growers Organize

The poultry growers of Montrose and Delta Counties, Colo., together with a number of growers from Mesa County, held a community dinner recently at which plans were perfected for the organization of a cooperative poultry marketing association. Organization committees were named, and it is anticipated that the association will control this year approximately 100,000 hens and 6,000,000 eggs.

## Section 3709, Revised Statutes, Not Applicable to Contracts for Purchase of Right of Way

THE United States is preparing to construct the Echo Reservoir, Salt Lake Basin project, Utah. Lines of the Union Pacific Railroad Co. are located within the flow lines of the reservoir, and it is necessary to remove the railroad lines to higher ground. The company proposed to enter into a contract by which it would do certain work on a cost-plus basis in connection with the change in location of its lines. The Comptroller General was requested to render advance decision whether, in view of section 3709, Revised Statutes, payment could be made on the cost-plus basis, if the contract were entered into. The decision permitted such payments to be made, the Comptroller General stating (decision dated August 4, 1927, A-19031):

The railroad company may, as an incident to the giving of its consent to the transfer of its present right of way to the United States and the removal of its lines to a different location, exact as a condition that the Government permit it to remove its lines at the cost and expense of the Government. If it is administratively determined to be more desirable to so contract with the railroad company rather than to acquire the land by condemnation or on an amicable purchase basis, this office will have no objection to the contract, if otherwise proper, when entered into without advertising for the removal of the railroad line to a different location at the cost and expense of the United States. It is to be understood, of course, that such items of cost and expense will not exceed available appropriations and that they represent reasonable items properly chargeable to the United States.

### AREA IRRIGATED (ACRES)

ARID IRRIGATION					
States	1889	1899	1902	1909	1919
Arizona.....	65,821	185,396	247,250	320,051	467,565
California.....	1,004,233	1,445,872	1,705,720	2,664,104	4,219,040
Colorado.....	590,735	1,611,271	1,754,761	2,792,032	3,348,385
Idaho.....	217,005	602,568	713,595	1,430,848	2,488,806
Kansas.....	20,818	23,620	28,922	37,479	47,312
Montana.....	350,582	951,154	1,140,694	1,679,084	1,681,729
Nebraska.....	11,744	148,538	245,910	255,950	442,690
Nevada.....	224,403	504,168	570,001	701,833	561,447
New Mexico.....	91,745	203,893	254,945	461,718	538,377
North Dakota.....	445	4,872	10,384	10,248	12,072
Oklahoma.....	.....	2,759	3,328	4,388	2,969
Oregon.....	177,944	388,310	439,981	686,129	986,162
South Dakota.....	15,717	43,676	53,137	63,248	100,682
Texas.....	18,241	40,952	61,768	164,283	322,656
Utah.....	263,473	629,293	713,621	969,410	1,371,651
Washington.....	48,799	135,470	154,952	334,378	529,899
Wyoming.....	229,676	605,878	773,111	1,133,302	1,207,982
Total.....	3,631,381	7,527,690	8,875,090	13,738,485	18,320,424

### RICE IRRIGATION

Arkansas.....	.....	.....	27,753	143,946
Georgia.....	7,856	8,581	.....	.....
Louisiana.....	201,685	387,580	380,200	454,882
North Carolina.....	3,283	3,422	.....	.....
South Carolina.....	29,690	38,220	.....	.....
Texas.....	8,700	168,396	286,847	2,340,404
Total.....	.....	251,214	694,800	862,292

### HUMID IRRIGATION

Alabama.....	89	95	.....	.....
Connecticut.....	471	379	.....	.....
Florida.....	1,538	3,772	.....	.....
Maine.....	17	17	.....	.....
Massachusetts.....	134	283	.....	.....
Mississippi.....	40	114	.....	.....
New Jersey.....	73	48	.....	.....
New York.....	68	159	.....	.....
Pennsylvania.....	814	903	.....	.....
Rhode Island.....	40	15	.....	.....
Total.....	3,284	5,788	.....	.....
Grand total, United States.....	3,631,381	7,782,188	9,487,077	14,433,285

1 Exclusive of rice irrigation.

## Reclamation and Settlement in Peru

THE Bulletin of the Pan American Union for July, 1927, contains an interesting discussion of agriculture and irrigation in Peru, in the form of a letter by Mr. C. W. Sutton, Government consulting engineer, Paíta, Peru, to Señor Enrique Torres Belon, who represented Peru at the Reclamation Section of the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held in Honolulu, Hawaii, in April, 1927. The following extracts are from Mr. Sutton's letter:

"To sum up, the Government in the last six years has constructed works to give complete irrigation to 40,000 acres. Of this total, 34,000 acres have already been colonized and are under cultivation. Within four months the irrigation of 10,000 additional acres will have been completed and will be colonized immediately, and there are under construction other works which will eventually irrigate 365,000 acres more. At the present rate of progress these projects can be completed at the rate of 40,000 acres a year and there is good hope of doubling this speed.

"Many precedents were studied for the colonization of the lands of the Pampas Imperial. As happens in the majority of cases, the land which was to be irrigated was not Government property. The possibility of settling this difficulty in the manner adopted in some other countries by putting an ad valorem tax on the land, reserving to the State the right to apply the tax in conformity with the valuation of the proprietors themselves, or to expropriate the land in accordance with the same valuation, was considered to be inapplicable on account of the strong resistance of the populace, whose elements were almost entirely formed of the owners of large tracts of arid or semiarid land.

"Recourse was, accordingly, had to the following expedient: Congress passed a law offering to purchase from the owners of the pampas half of their land within a certain period at the price of \$10 per acre, offering also to sell the water rights required to irrigate the other half which remained in the hands of the original proprietors. If within the period of time laid down the owners did not accept, then the State under the terms of this law could expropriate the whole at a price of \$10 per acre.

"The proprietors gladly accepted the conditions, and the Government sold the land in lots varying from 12 to 100 acres.

The terms of payment alike for the original proprietors and the new colonists were very favorable to the purchaser. The whole price had to be paid in 25 years, without interest. Interest was only collected upon overdue quotas.

"Apart from the works constructed and colonized under the immediate direction of the Government, there are other works which are being carried out with private capital but with Government assistance. The collaboration of the Government in one case takes the form of allowing the engineers of the State to cooperate with a private firm in drawing up plans with due respect to the public interest and which include a colonization program. In the second case the Government is assuming the debt of the firm and is completing the work at its own cost, thereby securing title to dispose of the lands in small lots for colonization."

## New Zealand Finds Readjustment Needed

In a recent article on "Soldier Settlers in New Zealand" in the International Review of Agriculture it is pointed out that in 1920 and 1921 consideration of the question of revaluation became imperative on account of the increasing difficulty found by the soldier settlers in meeting their obligations. The New Zealand Returned Soldiers Association in 1920 urged the setting up of local boards to consider applications for immediate relief pending revaluation. Later, the Government instituted district inquiry boards which reported that the revaluation of soldier rural properties was the only solution, and the Dominion revaluation board was set up in 1923. Review and readjustment of each settler's current account followed in 1924, and at the present time the soldier settlers of New Zealand are in the way of obtaining success. The total amount of capital invested in the scheme was about \$90,000,000, and the reductions by the Dominion revaluations board totaled \$10,000,000.

The actual construction of a small poultry house is comparatively simple, and poultry keepers who are handy with the use of a hammer and saw can easily build one.

## World Irrigated Area

The following tabulation, compiled by the Bureau of Reclamation from numerous sources, shows the estimated irrigated area throughout the world in 1926:

Algeria.....	400,000
Argentina.....	3,000,000
Australia.....	1,000,000
British Guiana.....	100,000
Bulgaria.....	20,000
Canada.....	400,000
Ceylon.....	350,000
Chile.....	59,000
China.....	1,000,000
Chosen (Japan).....	2,000,000
Colombia.....	51,000
Cuba.....	50,000
Czechoslovakia.....	15,000
Dominican Republic.....	25,000
Egypt.....	6,000,000
Finland.....	4,000
France.....	3,150,000
French Indo-China.....	3,470,000
French West Africa.....	5,000
Guatemala.....	41,000
Haiti.....	52,000
Hawaii.....	200,000
Hungary.....	35,000
India.....	50,000,000
Iraq.....	1,550,000
Italy.....	3,000,000
Jamaica.....	16,000
Japan.....	7,425,000
Java.....	8,350,000
Madagascar.....	1,500,000
Madeira.....	75,000
Mexico.....	5,700,000
Morocco.....	1,500,000
Palestine.....	25,000
Peru.....	1,000,000
Philippines.....	750,000
Porto Rico.....	70,000
Russia.....	8,000,000
Siam.....	1,750,000
South Africa.....	800,000
Spain.....	3,500,000
Sudan.....	100,000
Syria.....	400,000
Turkey.....	300,000
United States.....	20,175,000
Yugoslavia.....	12,000
Other countries with small areas.....	75,000
Total.....	137,500,000

## Rattlesnakes Relieve Patrolman's Monotony

The concrete-lined main canal of the Tieton division, Yakima project, Wash., which for 12 miles extends along the precipitous, rocky sides of Tieton Canyon, offers many attractions as a summer home for rattlesnakes. They have patronized it generously in spite of the inhospitable attitude of Vine H. Barr, the patrolman on the second section of the canal, who has killed 30 of them on his beat this summer.

A big one, over which he walked, retaliated by striking him on the leg.



Movable wooden trestle and steel forms for transporting and placing concrete in the Main Canal, Kittitas division, Yakima project, Wash.

## Manure Increases Yield of Irrigated Alfalfa

On the Umatilla reclamation project in north-central Oregon, along the Columbia River, the value of manure on alfalfa has been determined by an 11-year experiment under the direction of the United States Department of Agriculture. This project is typical of a number of irrigation projects adjacent to the Columbia River in Oregon and Washington, and the manure-alfalfa experiment was conducted on "lands that appear to be permanently nonagricultural under the practices of irrigation farming."

Manure was applied in 6 of the 11 years at the rate of 8 and 32 tons per acre. The average yield of air-dry hay from the check plot which received no manure was 3.71 tons per acre; that from the plots which received manure six times at the rate of 8 tons per acre was 5.07 tons; and that from the plots which received manure six times at the rate of 32 tons per acre was 6.10 tons.

The average annual increase due to the manure applied at the rate of 8 tons per acre was 1.38 tons of hay and to the application at the rate of 32 tons was 2.39 tons over the untreated check plots. While the manure applied in the latter case amounted to four times as much as in the former the increased hay yield was not quite doubled. Therefore, it is estimated that manure at the lighter rate is 127 per cent more valuable per ton than at the heavier rate.

The first essential in poultry housing is comfort for the birds. Unless they have comfortable quarters they can not be expected to lay well.

## Ways to Go Broke

Ten ways for a man to go broke farming:

1. Grow only one crop.
2. Keep no livestock.
3. Regard chickens and a garden as nuisances.
4. Take everything from the soil and return nothing.
5. Don't stop gullies or grow cover crops—let the top soil wash away, then you will have "bottom" land.
6. Don't plan your farm operations. It's hard work thinking—trust to luck.
7. Regard your woodland as you would a coal mine; cut every tree, sell the timber, and wear the cleared land out cultivating it in corn.
8. Hold fast to the idea that the methods of farming employed by your grandfather are good enough for you.
9. Be independent—don't join with your neighbors in any form of cooperation.
10. Mortgage your farm for every dollar it will stand to buy things you would have cash to buy if you followed a good system of farming.—*Exchange.*

To be comfortable a poultry house must provide plenty of room for the birds, be well supplied with fresh air, and always be dry.

While an abundant supply of fresh air at all times is essential, it is important that no drafts be allowed to sweep through the poultry house.

## Improve the Dairy Herd By Bull Associations

Every dairy herd needs a high-class bull at its head if the herd is to be improved. For the dairyman who has a small herd and is short on finances, the cheapest and best way to obtain the use of first-class bulls is through the work of a cooperative dairy-bull association. Such an association is a farmers' organization whose chief purpose is the breeding of better dairy cows through joint ownership, use, and systematic exchange of prepotent dairy bulls of high-producing ancestry.

Through the system of transferring bulls from block to block, the bull association makes it possible to keep the desirable bulls as long as they live or are fit for service. This enables a bull's daughters to come in milk and be tested while he is still owned by the association, and furnishes a means of determining which bulls are siring the high-producing daughters. The bulls that do not get satisfactory daughters are disposed of.

## Orchard Irrigation

The production of fruits and nuts on irrigated land has become an important part of the agriculture of the West. The selection of a suitable site is one of the most important factors in establishing a successful irrigated orchard. Success involves also the setting aside of good land, the proper use of irrigation water, and prudence in making the somewhat heavy expenditures required to purchase trees and to plant and care for them until they begin to bear. It is likewise essential to find out the adaptability of the variety of trees to be planted to the climate and soil of the locality, the adequacy and dependability of the water supply, the risk of high water table and alkali, the wages of labor and its quality, and the probable cost of packing, inspection, transportation, and marketing of the fruit. More detailed information is contained in Farmers' Bulletin 1518-F, Orchard Irrigation.

The time and frequency of fruit-tree irrigation depend primarily on the soil-moisture conditions within the root zone. The depth and spread of the roots is of importance in this connection.

Whether or not a dairy herd will be profitable from the very first depends largely on the selection of the foundation stock.

## Organization Activities and Project Visitors

**D**URING the absence of Doctor Mead in Palestine the Washington office is in charge of Assistant Commissioner P. W. Dent as acting commissioner.

A board of engineers, consisting of Oro McDermith, representing the Secretary of the Interior, Louis C. Hill selected by the Pecos Water Users' Association and the Fort Sumner irrigation district, and S. O. Harper, representing the bureau, met in the Denver office recently to complete its final report on the Pecos River investigations.

The advisers appointed by the Secretary of the Interior to review Colorado River matters, consisting of Senator Waterman, former Secretary Garfield, Governor Emerson, Professor Durand, and former Governor Scrugham, met with the Secretary in the Denver office on July 15.

Louis C. Hill, consulting engineer, was in the Denver office recently in connection with his report on the proposed power development at Elephant Butte Dam Rio Grande project.

Fred C. Scobey, irrigation engineer, Department of Agriculture, spent several days on the Grand Valley project measuring the flow in the concrete flume of the Orchard Mesa irrigation district and the steel flume of the project main canal across Indian Waste. He plans to return later to make further tests on siphons, pipe lines, and other structures. Mr. Scobey also visited the Uncompahgre project for hydrographic tests on the Happy Canyon flume of the Montrose and Delta Canal, and plans to conduct hydraulic jump tests at various points on the project during the season of 1928.

District Counsel Stoutemyer, Engineer Willard G. Steward, and Assistant Engineer G. H. Hogue were on the Boise project for several days in connection with the Boise River flood water case.

Superintendent George O. Sanford of the Sun River project visited the St. Mary storage division, Milk River project, recently, and together with Superintendent Johnson of the latter project made an inspection of the conditions along St. Mary Canal and the repair work in progress.

Recent visitors to the Minidoka project included Senator W. E. Borah, Representative Addison T. Smith, George N. Carter, State Reclamation Commissioner, and D. C. MacWatters, of Los Angeles, former manager of the Kuhn interests in Idaho.

John H. Pellen, chief draftsman, Washington office, who has been ill for several months, has returned to work. Lawrence A. Wallace, of the Washington office legal force, has also resumed his duties after an illness of several weeks.

A. N. Burch, engineer, with headquarters at Reno, Nev., continued work on Truckee and Carson River storage investigations.

C. S. Scofield, agriculturist, Department of Agriculture, and Thomas H. Means, former project manager, visited the Newlands project during the latter part of July. Both were interested particularly in drainage development as affecting the permanence of agriculture on the project.

John T. Whistler, representing the Bank of Italy, spent a day recently on the Newlands project looking over lands and properties covered by mortgages held by the Peoples Bank of Sacramento and now owned by the Bank of Italy.

Recently visitors to the Klamath project included Mr. McArthur, secretary of the Oregon Geographic Board, Doctor Levin of the Oregon State Board of Health, and District Counsel R. J. Coffey.

Dr. Warren T. Smith, professor of geology, University of Oregon, arrived at the Owyhee dam site late in July for a geological examination of the dam site.

J. S. Matthews, of Concord, N. H., was on the Belle Fourche project recently to confer with the associate reclamation economist relative to the development and sale of his farm.

The Yakima project was visited during the month by Senator Wesley L. Jones, H. W. Bashore, superintendent of the Vale project, and B. E. Hayden, reclamation economist.

Senator C. C. Dill and Representative Sam B. Hill were recent visitors on the Okanogan project.

Among the recent visitors to the River-ton project were Secretary Work, Chief Engineer Walter, Senator John B. Kendrick, Representative Charles E. Winter, and J. B. Lamson, agricultural agent of the Burlington Railroad.

H. N. Savage, former supervising engineer of the Bureau of Reclamation, spent a day recently on the Riverton project.

John R. Iakisch, associate engineer on the Shoshone project, has been assigned to drainage investigations on other projects, and left Powell at the end of July. I. B. Hosig, associate engineer, has been assigned to secondary project investigations, Heart Mountain division.

E. N. Westervelt, land commissioner, and J. B. Lamson, agricultural agent, of the Chicago, Burlington & Quincy Railroad, were recent visitors to the Shoshone project, Wyoming.

Recent visitors on the Rio Grande project included Thomas Hill, chief engineer of railways, Melbourne, Australia; E. A. Bayley, assistant engineer, department of water and power of the city of Los Angeles; and Consulting Engineer L. C. Hill.

During July 796 visitors were shown through Elephant Butte Dam, Rio Grande project, including 70 members of the West Texas Chamber of Commerce.

Miss Elizabeth von Hagen, clerk, has been transferred from the Yuma project, Arizona, to the Rio Grande project, New Mexico-Texas.

Painting adds to the appearance and durability of buildings. All surfaces should be clean and dry before they are painted.

Buildings should be painted soon after they are constructed to preserve the wood and to prevent cracks from starting between the boards.



V. 18, no. 10

# NEW RECLAMATION ERA

VOL. 18

OCTOBER, 1927

NO. 10



THE HARVEST

# CONSTRUCTION RESULTS

## BUREAU OF RECLAMATION

To June 30, 1927



<i>Storage and diversion dams</i> . . . . .	<i>117</i>
<i>Volume (cubic yards)</i> . . . . .	<i>20,206,351</i>
<i>Reservoir capacity (acre-feet)</i> . . . . .	<i>12,556,653</i>
<i>Canals, ditches, and drains (miles)</i> . . . . .	<i>13,033</i>
<i>Tunnels</i> . . . . .	<i>110</i>
<i>Length (feet)</i> . . . . .	<i>155,172</i>
<i>Canal structures</i> . . . . .	<i>145,294</i>
<i>Bridges</i> . . . . .	<i>11,174</i>
<i>Length (feet)</i> . . . . .	<i>262,626</i>
<i>Culverts</i> . . . . .	<i>12,925</i>
<i>Length (feet)</i> . . . . .	<i>476,904</i>
<i>Pipe (linear feet)</i> . . . . .	<i>3,759,800</i>
<i>Flumes</i> . . . . .	<i>4,550</i>
<i>Length (feet)</i> . . . . .	<i>836,580</i>
<i>Power plants</i> . . . . .	<i>35</i>
<i>Power developed (horsepower)</i> . . . . .	<i>155,903</i>
<i>Telephone lines (miles)</i> . . . . .	<i>3,350</i>
<i>Transmission lines (miles)</i> . . . . .	<i>1,761</i>
<i>Excavation (cubic yards)</i> . . . . .	<i>256,426,258</i>

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

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## *Interesting High Lights on the Reclamation Projects*

**O**PERATIONS at the Kadota fig-preserving plant on the Orland project for the handling of the season's crop of figs have begun. A successful season is anticipated by project growers.

**A**N exhibition was held recently on the Grand Valley project of the work of the boys' and girls' clubs, which was well attended. The Dairy Cattle Breeders' Association also exhibited livestock and made a very creditable showing.

**A**T Gibson Dam, Sun River project, it appears that the solid rock excavation for the completed foundation will amount to considerably less than the estimated quantity of 53,000 cubic yards, and the excavated quantity of earth and loose rock will show a large increase over the estimated quantity of 7,000 cubic yards. It is expected that the foundation will be excavated for about \$20,000 less than was anticipated under the quantities and unit prices listed in the contract schedule.

**A**T Stony Gorge Dam, Orland project, the contractor's efforts during the month were directed mainly toward finishing the work within the cofferdam below water level of the creek, which must be done before the winter flood season. If this can be done early enough the south channel will then be inclosed in a cofferdam and excavation will be started there this fall.

**A**CTIVE interest is being shown in the growing of mint on the Sunnyside division of the Yakima project. Mint from 11 fields has been distilled this past summer, with yields of 25 to 60 pounds of oil of superior quality per acre. This is reported to be considerably better than is obtained in the Michigan and Indiana fields, where most of the world's supply of mint is grown.

**A**T the end of the month the attorney for the Vale-Oregon irrigation district, Vale project, stated that 9,359 acres had been signed under the "incremented value" contracts and 7,358 acres under the "excess" land contracts.

**A** THREE-ACRE field of Federation wheat, belonging to Robert DeLong, near Paul, Minidoka project, produced 283 bushels, or an average of 94 bushels per acre. Another high average was obtained on the Mrs. Henry Hite farm, near Rupert, where 700 bushels of Federation wheat were threshed from 8 acres, an average of 87½ bushels per acre.

**A**T a ram sale at Filer, Idaho, under the auspices of the Idaho Wool Growers' Association, Minidoka project animals brought fancy prices. E. R. Kelsey, of Burley, sold a pen of five buck Hampshire lambs at \$43 per head, two Suffolk lambs for \$74 each, and one Suffolk for \$90. C. W. Thomas and George Reed, also of Burley, sold some fine young rams for \$35 to \$50 a head.

**D**URING the month several prospective settlers from Colorado looked over the Lower Yellowstone project and expressed themselves as very agreeably surprised at conditions there. These men have stated that they will return and purchase farms as soon as their beet harvest is over.

**T**HE Hunt-Mayfield cotton gin at Las Cruces has been taken over by the Mesilla Valley Farmers Gin Company, a cooperative farmers organization with a capital stock of \$30,000 and a charter applied for. More than 115 farmers subscribed for the stock. A canning factory has been erected at Mesquite and is open for business, and chile growers at Vinton are preparing to erect a plant for drying and canning this product.

**A**T the request of the Klamath County Potato Growers' Association and in order to advertise Klamath County potatoes, wholesale dealers have agreed to mark all sacks of high-grade potatoes marketed from the project with the word "Klamath."

**P**RICES offered for the apple crop on the Okanogan project are encouraging and growers with an average crop are anticipating good returns for their season's work. Warehousing concerns were busy getting their equipment and organization ready for work, which was expected to start the latter part of September.

**A**N attempt is being made by San Diego capital to organize a cottonseed oil company for the manufacture and sale of cottonseed oil and cake, the plan being to issue blocks of stock to the cotton growers' associations in the Salt River, San Joaquin, and Yuma Valleys. This stock will be purchased at par and will be paid for out of profits, the cotton grower obtaining the regular market value for his seed in cash. The proceeds of the sale of the products, after deducting all expenses of operation and interest on preferred stocks, will be paid to the grower in the form of dividends, such dividends to be applied on this stock until the stock is paid for, after which the dividends will be paid in cash.

**A** REPRESENTATIVE of the Louisiana potato growers visited the Milk River project recently and obtained options on practically the entire seed potato crop at prices very satisfactory to the growers. The Potato Growers Association entertained representatives of the Louisiana University and the Great Northern Railroad during a tour of the potato fields.

## President Coolidge Visits the Belle Fourche Project, S. Dak.

PRESIDENT Coolidge made a visit to the Belle Fourche irrigation project on September 1 to view the country included in this Federal enterprise and to observe the practice of applying water to growing crops. He was also a guest at the Butte County Fair, where the products of the project were displayed.

The President, accompanied by Mrs. Coolidge and the official party, journeyed by train from the summer White House in the Black Hills and arrived at Newell

shortly after noon. A trip to the United States experimental farm and a short stop at the reclamation office were on the program for the day. A hearty welcome was extended the President and his party by Mr. W. D. Buchholz, secretary of the irrigation district, who acted as spokesman for the occasion and who invited the President to make his home in this valley upon retiring from office. A gift of 160 acres of irrigated land was offered as an inducement to enroll the President in the ancient

fraternity of irrigators. As a token of esteem and a reminder of his trip to the project the President was presented with a miniature gold irrigation shovel, emblematic of the wealth to be dug from the soil of the fertile Belle Fourche Valley under the stimulating influence of irrigation.

Mr. Buchholz, in presenting the token, called attention to the development brought about by Federal reclamation wherein cooperation between the Government and a progressive people has transformed a grazing country into one of high production in specialized crops.

The shovel is engraved on the front with a canal scene showing water passing from the Belle Fourche River to the prairies, where it gives life and growth to the crops and vegetation of this irrigated region. On the back is inscribed the following:

Belle Fourche Irrigation Project  
Newell, S. D., Sept. 1, 1927

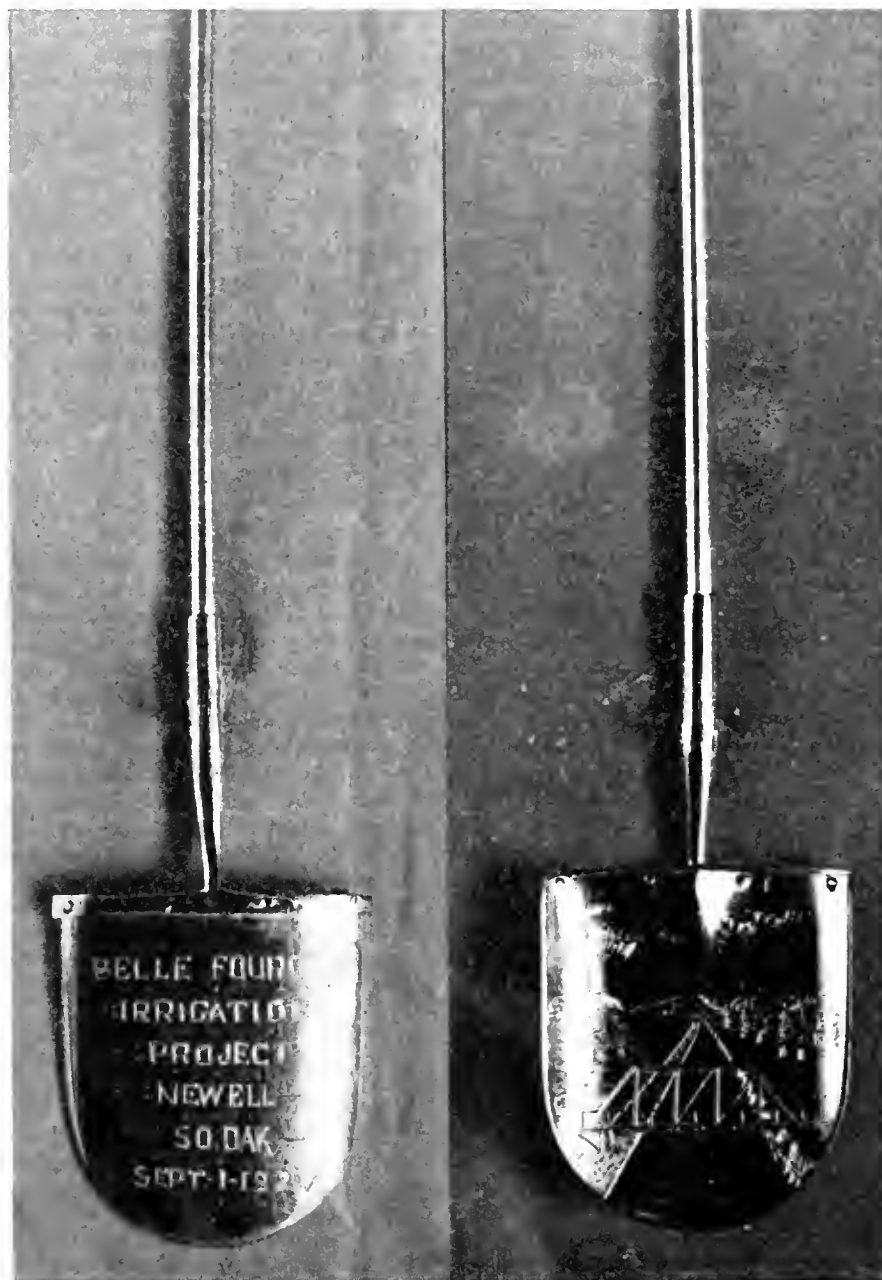
"I accept this gift with pleasure, and I shall treasure it as a memento of my visit to your section," President Coolidge replied as he took the shovel. "I am much interested in reviewing progress of your irrigation project. A year or two ago we were not certain that it was going to be a success, but more recent experience has demonstrated it is a success. I am sure that it will contribute to the success of this region, and I am sure it will be able to sustain a large population and increase the productivity of the soil in this region."

The presidential party next visited the Butte County Fair at Nisland and had occasion to view the stock parade and the extensive exhibits of agricultural products and home economics displayed in the pavilion. (See back cover page.)

Charles M. Reid, member of the fair board, in a very appropriate talk, presented the President with a pair of blooded lambs that would serve to round out his suggested farming operations. The President responded smilingly and spoke of the generosity of the people of this section, who had presented him with enough equipment to become a full-fledged farmer of South Dakota.

"I am becoming very attached to the Black Hills," said the President. "Since I have been here I have been presented with a fine saddle horse and all of the accouterments. This afternoon I was promised that I would be made the possessor of a 160-acre farm in this fertile valley if I would return to live here, and

(Continued on page 147)



Miniature irrigation shovel presented to President Coolidge on the Belle Fourche Project

## *Economic Notes From the Irrigation Projects*

### *Plans For Settlement, Belle Fourche Project, South Dakota<sup>1</sup>*

*By F. C. Youngblutt, Project Superintendent*

**I**N presenting plans for settlement of the Belle Fourche project it is necessary to outline briefly the economic distress and agricultural difficulties that followed the deflation of 1920 and which finally became so pronounced that Congress considered abandonment of the project. The condition that confronted the Belle Fourche project no doubt to some extent existed on all our Federal projects, but was more aggravated on the Belle Fourche because the proportion of nonfarming settlers was greater than elsewhere and in the earlier years this seemed to be a fertile field for contention and animosity toward the Government, which left no precedent for cooperation to make the project a going concern.

The present activity should properly be termed "resettlement" because the public lands were all homesteaded previous to 1918 and have passed to private ownership. About 37,000 irrigable acres of public land were entered for the most part by people who had no foundation for an agricultural life and were particularly unsuited to the trials of irrigation farming, and who as a rule did not intend to become farmers. Business and professional men, clerks, school teachers, preachers, and plumbers all considered it genteel to own an irrigated ranch and although disappointments came early they nevertheless considered that speculative possibilities would more than balance the lack of

profitable production. In 1921 by actual count there were 6,500 acres owned in the town of Newell by men engaged in occupations other than farming, to say nothing of similar holdings in other towns of the project and adjacent Black Hills cities.

For a number of years these holdings were sustained by reserve capital or money earned in other pursuits. They practiced some farming, either by proxy or by their own efforts and succeeded in getting a considerable area in alfalfa, but generally there was insufficient preparation of the ground, ditches were constructed in a haphazard manner, and too much land was left in the raw state. The war came on and with even a minimum of farming alfalfa sales at \$25 a ton meant a big profit. Land prices were good and were going higher. Tracts which to-day we are offering at \$30 to \$50 per acre were selling at \$75 to \$125 per acre. Credit was liberal and a mortgage of \$30 to \$40 per acre enabled some to obtain an equity in another tract. These holders did not care to sell because each day brought better offers. Mortgage companies were inclined to extend their investment because the security appeared to be first class and interest could be turned into a higher principal. In this way an unhealthy credit situation was developed along with an unhealthy agriculture.

#### *THE DEPRESSION OF 1920*

The reaction which began in 1920 brought the collapse and demonstrated that a successful project must be founded on an agriculture which should be developed along with irrigation. Depreciated values wiped out equities and other farmers left the land because alfalfa was no longer worth the raising and city wages were good. Mortgage companies acquired numerous tracts which went out of production. Land that had been sold on small down payments went back to original owners who had already left the project. A large portion of the school land went back to the State through cancellation of purchase contracts. The project at no time had a sufficient number of farmers for intensive production and on top of this, in a few years of depression, 25 per cent of these disappeared. The established element of livestock farmers occupied 27 per cent of the farms and tenants 18 per cent, so that 55 per cent had no occupants.

Things drifted along through the lean years with the economic outlook and morale at low ebb. Taxes were neglected and the irrigation district collected practically nothing for water, although service continued under various relief plans. One hundred dollars payable at the end of the crop year would rent a good 80 in alfalfa, while the overhead charges, amounting to about \$400, gave no one concern. Some farmers who were dispossessed remained and found they could rent their former holdings at less than general taxes. Through foreclosure and other adjustments ownership of the farms became scattered all over the United States from New York to Los Angeles, and from Florida to Minneapolis, and these owners, finding there was no sale at any price, gave little or no attention to their distant property. Investors in tax titles were not interested in this security which everyone appeared anxious to unload and which appeared destined for the scrap heap along with the project.

#### *PLANS FOR REHABILITATION*

This in brief brings us up to the fall of 1925, when rehabilitation plans were first considered. Fifty farms of the abandoned type were analyzed and we found the unpaid taxes and water charges averaged \$15 and ran up as high as \$25 per acre, with a mortgage in many instances that meant a total indebtedness of \$50 per acre above the project construction cost. In this way tracts of land that were presented to the homesteader free of encumbrance with a productive soil and ample water supply in 10 years were consumed by overhead charges and unsound finance. After some study by the Reclamation Bureau it was at first proposed that the Government should acquire the non-producing tracts and begin a community development under a plan founded on selected settlement and supervised agriculture. This had merit and seemed to fit the project needs but failed to materialize for lack of law.

The proposed abandonment of the project brought a stir from local organizations, and its friends got busy on means of saving their investment. A conference was called, participated in by Doctor Mead, Mr. Kreutzer, the railroad company, mortgage companies, local organizations, and others to discuss plans for making the enterprise a going concern. A very cooperative spirit was manifest

<sup>1</sup> Address at the Denver Conference, March 18, 1927.

## *President Coolidge on Belle Fourche Project*

(Continued from page 146)

now I have been presented with two sheep. It happens that these presents round out just what I need to become a farmer in South Dakota. I already am the possessor of a herd of cattle, and with these additions I am fairly equipped to become a citizen representative of the Black Hills of South Dakota.

"This is another very fine exhibition of the splendid hospitality I have met here this summer, and, as I may not have another opportunity, I take this occasion to express to you the deep appreciation of myself and my family for all the hospitality and many tokens of affection that have been accorded us, and I assure you that we will take back to Washington a memory of a very pleasant vacation."



and a new program mapped out that has been well supported by the interested parties. The plans for rehabilitation included the following principal features:

- A. Appraising and securing options on farms.
- B. Settlement of the unoccupied farms.
- C. Publicity for our agricultural advantages.
- D. New industries to stimulate agriculture.
- E. Drainage of the unproductive lands.

### APPRAISALS AND OPTIONS

The appraising and option matter was handled largely by the project office. A committee visited the farms and fixed a value, and the owner was invited by correspondence or by a personal call to list the place on the standard option form which had been prepared. In cases where the appraisal was above the owner's price, the option was made out to agree with the lower figure. To illustrate this situation, we had one farm appraised at \$4,400 which was listed at \$1,000 because the nonresident owner was willing to take this amount. The place was one of the first to move. We obtained good cooperation from a great many of these nonresident holders, and particularly from the Scottish American Mortgage Co. These people had 25 farms on their hands which they listed at a considerable loss. In this way we obtained control of 95 farms, covering 6,500 irrigable acres, most of which can be bought on the basis of 10 per cent down and 20 years' time at 6 per cent, and the State owns about 4,000 acres more, which is considered part of the listings for resettlement. These places under option are not a large proportion of the project, but we think sufficient to control prices for several years.

The settlement and sale of these farms is to be handled by the economics department of the bureau. The man in charge is to be a part of the project organization, and it will be his duty to find the settlers, get them located in the right place, assist in handling tenants, direct the new farmers in their agriculture, purchase of stock, and equipment, supply information on methods and materials, and in general to provide an agency where farm problems will be given consideration. This activity will be extended to the project as a whole, and if a prospective settler is not suited with the farms under option, we propose to interest him in other places for sale, if his funds permit.

### WIDESPREAD PUBLICITY

Publicity for the advantages offered is an important feature of settlement. To this end, the Government has published

a booklet which deals with the farming opportunities on the project, gives the list of farms for sale under option, and includes descriptive details of all those features which a prospective settler seeks. The railroad company proposes to publish a similar booklet dealing with the same opportunities from slightly different angles. Locally we manage to get out articles and news items on crop and industrial developments, which the dailies copy in the section to our east, and in that way keep the project in the limelight. We have had very favorable write-ups in the Minneapolis, Denver, Chicago, and Kansas City papers, and the shorter news items appear frequently in the Sioux Falls and Sioux City dailies. The Belle Fourche Commercial Club has issued an illustrated folder which calls attention to the project by means of pictures, and the irrigation district also has published a leaflet, which is sent out in answer to the first inquiry. New industrial developments of any magnitude carry with them a natural publicity, which in our case has been very helpful in securing new beet farmers.

### INDUSTRIAL DEVELOPMENT

About the time our economic situation began to improve along came the announcement of a sugar factory for the project and gave the entire rebuilding program a wonderful boost. The factory is largely the result of the untiring efforts of the Belle Fourche Commercial Club. They worked on this feature for 15 years, sending their emissaries to all parts of the country and finally landed the industry. The announcement immediately brought in beet men in such numbers that practically all our farms with a habitable set of buildings will have a resident operator next year. Inquiries are coming in from many parts of the country concerning opportunities on the project. More farms have been sold in the last few months than in six years before. The morale took a decided brace when it became apparent that new capital was willing to take a chance in the valley. The same farmers who only a year ago were back tracking have taken a new hold and are settling down to a real agricultural program. A sugar factory brings in many things besides beet raisers. This company already has four trained experts on the ground who are beginning to advise the farmers on rotations, about getting beet land ready, and to urge cleaning up, hauling manure, and where possible to plan their stock feeding and pulp handling next fall, and other things that go to stimulate production. These men have a fertile field in which to work, with pros-

pects of changing some ragged farming to a very attractive agriculture, which our irrigated farms should present. The pickle industry on the project is to be expanded by erecting additional salting stations and a 12-mile railroad spur will tap the best beet area.

The rebuilding activities for the project include the important item of drainage. The Belle Fourche project has no drainage system and about 10,000 acres of land have already become unproductive. Through the recommendation of the commissioner, we have a million-dollar construction program approved that should reclaim the land and protect other areas from seepage.

### PROBLEMS TO BE SOLVED

The progress of the program has uncovered a few problems that have not been solved. I refer principally to credit with which to improve the undeveloped farms. Most of the unoccupied tracts need buildings and some require extensive leveling and ditching. If Government aid for these features was available, as advocated by Doctor Mead, our settlement plans would be complete. As a youngster in southern Wisconsin I recall when the last of the hardwood forests were being cleared away to make room for agriculture. These pioneers from northern Europe had hewn away at the oak trees for 30 years and in that time had built real farms out of the Indian's hunting ground. They were content to clear a few acres a year and by thrift and industry they gained a competence along with a home and well developed farm. To-day if we brought a prospective settler to our irrigated farm and told him that the soil was good and water plentiful, but that to take off the sage brush, level, and develop the farm might take 25 years he would be off to the city, where pay day comes once a week. The pioneering spirit is a thing of the past and to place good farmers on our irrigated land requires that the proposition be attractive and must give promise of profit in a reasonable time. Settlement on the Belle Fourche project will gradually absorb the less desirable places, but the program will be under a handicap until we solve the matter of credit for improvements, livestock, and equipment, which are vital in making farms out of our project lands.

**A**N economic survey of the Montana irrigation projects is being made by the Montana State Agricultural College, under the supervision of Prof. M. L. Wilson.

## South Dakota Irrigated Land In Demand

OTTO C. Batch, agent for the Department of the Interior on the Belle Fourche Federal irrigation project at Newell, S. Dak., reports up to the first week in September the sale of 14 project farms for \$54,701. The total area of farms sold amounts to 1,785.5 acres at an average price of about \$30 per acre. The farms sold vary from 40 acres to one of 480 acres, and the prices from \$12.50 per acre to \$54 per acre.

This activity in land settlement on the Belle Fourche project is being carried out cooperatively by the Federal Government, Belle Fourche Irrigation District, Chicago & North Western Railway Co., and the various chambers of commerce of the towns included in the project. The plan of land settlement put into effect late in 1926 provided that the farms offered for sale would be appraised by a board of independent appraisers who were familiar with soil and farm conditions in the district. Options were then taken by the Department of the Interior and at the appraised value and running to Decem-

ber 31, 1928. This insured that every settler who bought a farm on this project would get his money's worth. A uniform contract of purchase was worked out providing that settlers could obtain these farms for the payment of 10 per cent in cash at the time of purchase and the remainder in 20 years on the amortized plan with interest at 6 per cent. The plan has the advantage of offering to settlers irrigated farms at a very reasonable price and on terms that can be paid for out of their farm incomes.

The Belle Fourche project was constructed by the Federal Government at a cost of approximately \$4,000,000, and includes 70,000 acres of irrigable land in the vicinity of Belle Fourche, Newell, and Nisland, S. Dak. It has long been known as a livestock center. Good crops of alfalfa, small grain, corn, and sugar beets are regularly produced. The water supply is provided from the Belle Fourche dam, which impounds 203,000 acre-feet of water. This is sufficient for a two years' supply. The water is carried from

this reservoir in canals and delivered direct to each farm. The operating cost is one of the lowest of either private or Federal projects.

Along with this program of land settlement the project is being developed industrially. The Utah-Idaho Sugar Co. is completing the construction of a large beet-sugar factory at Belle Fourche in time to take care of the 1927 beet crop. This company estimates that 9,000 acres of sugar beets will be harvested this year with a yield of approximately 100,000 tons. On the project are a number of pickle-salting stations, the one at Nisland reputed to be the largest in the world. The Chicago & North Western Railway Co. is building a number of spurs through the project to transport beets from farms to factory.

Mr. Batch reports that five farms were sold during August and three farms during the first week of September. Inquiries and land seekers visiting the project are on the increase, which indicates that there will be considerable land sold during the fall and early next spring in readiness for the 1928 cropping season. Sufficient options have been secured to take care of a large number of settlers.

## Settlement of the Tule Lake Division Klamath Project

ON March 1, 1927, the Secretary of the Interior opened to entry under public notice, 145 farm units ranging in size from 13 to 87 acres in the Tule Lake Division of the Klamath irrigation project, Oregon-California.

The land is a portion of the old bed of Tule Lake, which was unwatered through the construction of a diversion canal to take flood waters into Klamath River, and by the construction of Clear Lake and Gerber Reservoirs.

The land is fertile, of exceptionally smooth topography, and requires no clearing. Adjacent to the lake, on a large area which is not yet supplied with water, grain crops are being raised this year by lessees from the United States, yielding as high as 70 bushels of wheat and 100 bushels of barley per acre. This is an indication of the value of this land for farming purposes. These crops, however, were produced close to the edge of the lake where moisture conditions were favorable. As distances increase from the water's edge moisture must be supplied by irrigation.

On August 16, 1927, 138 of the farm units opened to entry in March, 1927, had

been granted to applicants approved by the Board of Examiners as to industry, experience, character, and capital. The 7 remaining farms had been applied for by 10 applicants. Eighty-six of the applicants approved up to June 15, 1927, possessed an average capital of \$5,600. Fifth-three of them were soldier entrymen. The smallest amount of capital possessed by any approved applicant was \$2,200, and 8 applicants have more than \$10,000. Of the 86 applicants 52 were from towns on the Klamath project. A considerable number will not change their address through securing these farms, which are adjacent to Malin, Oregon. Approximately 90 per cent of the applicants came from Oregon, Washington, and California. Many of these were aware of the attractive opportunity the Tule Lake land offers for farming and have waited for this opening. Considerable publicity was given to the opening by the Oregon State Chamber of Commerce, local newspapers on the Klamath project, and the Southern Pacific Railway Company. Very few of the applicants came from east of the Rocky Mountains.

None of the applications were approved and no filings were completed before May, 1927, but even at that late date a number of settlers were able to plow their land, level, construct head-ditches, and sow a crop of oats and alfalfa, which was making excellent growth. Seventy of the settlers were on the ground building houses, erecting fences, and carrying on other development work.

This good showing in rapid settlement can be summed up briefly as being due to the excellent opportunity offered farmers on the Tule Lake Division, namely, rich soil, level topography, public land, and reasonably priced water. No special agencies were at work to secure settlers, although all the agencies interested helped considerably.

CONFERENCES with mesa water users, the chamber of commerce, and business men regarding development and settlement on the Yuma Mesa evolved a plan involving the enactment of legislation providing that the Government level the land and construct the irrigation system on each individual tract, capitalizing these with the construction cost of the irrigation works and the cost of the land, the settler to pay at least 10 per cent in cash and the remainder to be repayable on an amortization basis in 20 years with a low rate of interest.



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



### What Is It All About?



Vegetable garden. The housewife's "charge"

**H**OW many of us go on day after day in a simple routine manner without ever stopping for a moment to figure out what it is all about. Are we working to exist, or for a goal?

The happy faces of care-free children on our projects, the wonderful schools built for them; roads, parks, and other evidences of civic pride show our project population is working for a goal.

The same pioneering spirit that dictated the establishment of their homes on sagebrush land urges them to give to posterity a better place to live than they settled on. Progress is the watchword and as long as there is something to work for, it is all done so willingly and with less effort.

Fixing a goal and planning methods of approach to it, in advance, is one way of eliminating the uncertainty of not getting what you want. Large enterprises have to be planned in advance; why not small ones? Everything you do can be worked out in this manner.

As the fall comes creeping on us there is a feeling akin to the "New Year's resolution season." The children have gone back to school and we start to figure out what the year's operations netted us, and experience will dictate a

better way to lay plans for the coming year.

Now is a good time to start a budget. Count on getting all the things you want during the coming year. Aim high—you are liable to fall short.

Can't you feel the new life such planning instills in you? Employ your imagination.

Watch children at play and notice the real pleasure they get out of the simplest games. It is mainly because of their imaginations. They are not visionary; the things they do do not take on unreal or fanciful proportions; they are real material things to them.

Now is the time to plan on doing or getting the things you want. If this involves the expenditure of funds the housewife might be able to evolve some plan for an additional income during the year—the vegetable garden and the poultry yard are old standbys as sources of revenue.

Give your story to the ERA.

The following article about the Butte County fair and the visit of our President, Mrs. Coolidge, and John Coolidge, was graciously contributed by one of the women who has been associated with the fair since its inception in Butte County in 1921. She writes that she has seen it evolve from a few tents into good substantial buildings for the different departments.



Thriving on one of our projects

## Our Butte County Fair

By Mrs. P. P. Vallery, Superintendent of Women's Department

The Women's Department is made up of Women's clubs of Butte County, and the individual exhibit, which is open to all, not only of our county but adjoining counties who wish to enter.

The clubs have three specials from which to select their exhibits. These specials comply with the classification of the individual exhibit and are judged with the same score cards.

*Special No. 1.*—Textiles and canned products. This carries prizes from \$15 to \$4.

*Special No. 2.*—Baked and canned products. The prizes are from \$12 to \$2.50.

*Special No. 3.*—Textiles. With prizes from \$10 to \$2.50.

One article from each class of the textiles and each article in every class of canned and baked products must be exhibited by the clubs that are entered.

Special attention is given to decoration of the booths and arrangement of articles exhibited. This year the clubs used the Denison crêpe paper in autumn colors for decoration and the effect was very fine. We plan to decorate in this way on a larger scale next year.

A very important part of our department is the baby show contest under the supervision of Mrs. Beyer Aune. Much interest is taken in this contest and many babies entered. It is not a clinic, but simply a contest of weight and measurement. The prizes range from \$10 to \$2.50.

We try to make a specialty of made-over garments and have had some very good work on exhibit.

Quilts and bedspreads have brought out very beautiful work and more interest is manifested in rugs each year.

If you could see the canned vegetables and fruits, the preserves and conserves, the jellies and pickles and the fine bread, cakes, and pies, you would realize that we have many good housewives and homemakers among us.

Everything displayed must be made within the year, that is from one fair to the next. The clubs at the first meeting after the fair select their special exhibit and are busy all the year filling the requirements of that special. Pickling and preserving for the next year are done immediately as our fair comes so early that many things are not matured and ready for use.

The clubs from the country always take the first prizes because they concentrate on the fair work throughout the year, and the town clubs have many diversions.

To many of our women this work is a great pleasure and incentive all the year.

It gives an opportunity to compare work and exchange ideas. The whole object of the woman's department is educational.

To me the very best part is the hearty cooperation of all the women, each doing her part and more when necessary.

This year we were honored by having the President and Mrs. Coolidge with us for a short time on the afternoon of September 1. After being welcomed and viewing the parade and races they visited the women's department.

The pavilion where the exhibits are was cleared of all persons except one at each booth and Mrs. Beyer Aune and myself who stood at the open door to receive and show the presidential party through our department. Mrs. Aune took her place beside the President and I walked with Mrs. Coolidge. Little Betty St. Marea stood beside a flower-laden table near the door and as we passed presented Mrs. Coolidge with a bouquet from the women's department. A small bouquet tied with the club colors was also presented to Mrs. Coolidge by the lady in charge.

We hope for a still bigger and better fair next year.

## Problems of Our Projects

The policy of banding together for more effective action is as old as the stone age. This principle in modern times gives vent to itself in cooperative organizations.

A short lead as to the benefits to be derived by the formation of such associations appears in the September issue.

In discussing activities of farm women with a group of ladies in the lower Rio Grande Valley it developed that a few years ago they decided to do their bit by raising chickens. The flocks increased, so did the egg supply but, one woman said, "What is the use, we have no market for them." The market exists but the organization to find it is not there.

In laying the foundation for a solvent cooperative organization remember that a large percentage of successes invariably attribute their success to the factors of "efficiency of the manager and the cooperation and loyalty of the association's members."

You people on the projects who have organizing ability call your neighbors together and talk it over. Several get-togethers might be necessary to outline your course of action, but as you go along individual problems will be brought up and will thrash themselves out, and when you are ready to organize, the main issues only will remain to be handled.

This is not a pioneering field and many precedents may be used as guides. Volumes have been written, for instance, on cooperative poultry and by-products associations set up in this country and abroad. These often relate obstacles met and conquered. This gives you the benefit of the experience of those who are now enjoying the marketing of their products through cooperative organizations.

I hope this will at least start you thinking about it.



Tree-lined highway. Make this one of your goals



# Experimental Work on Small-Scale Models of Arch Dams

*Miniature Dams, Loaded With Mercury, To Provide Data Needed For Design*

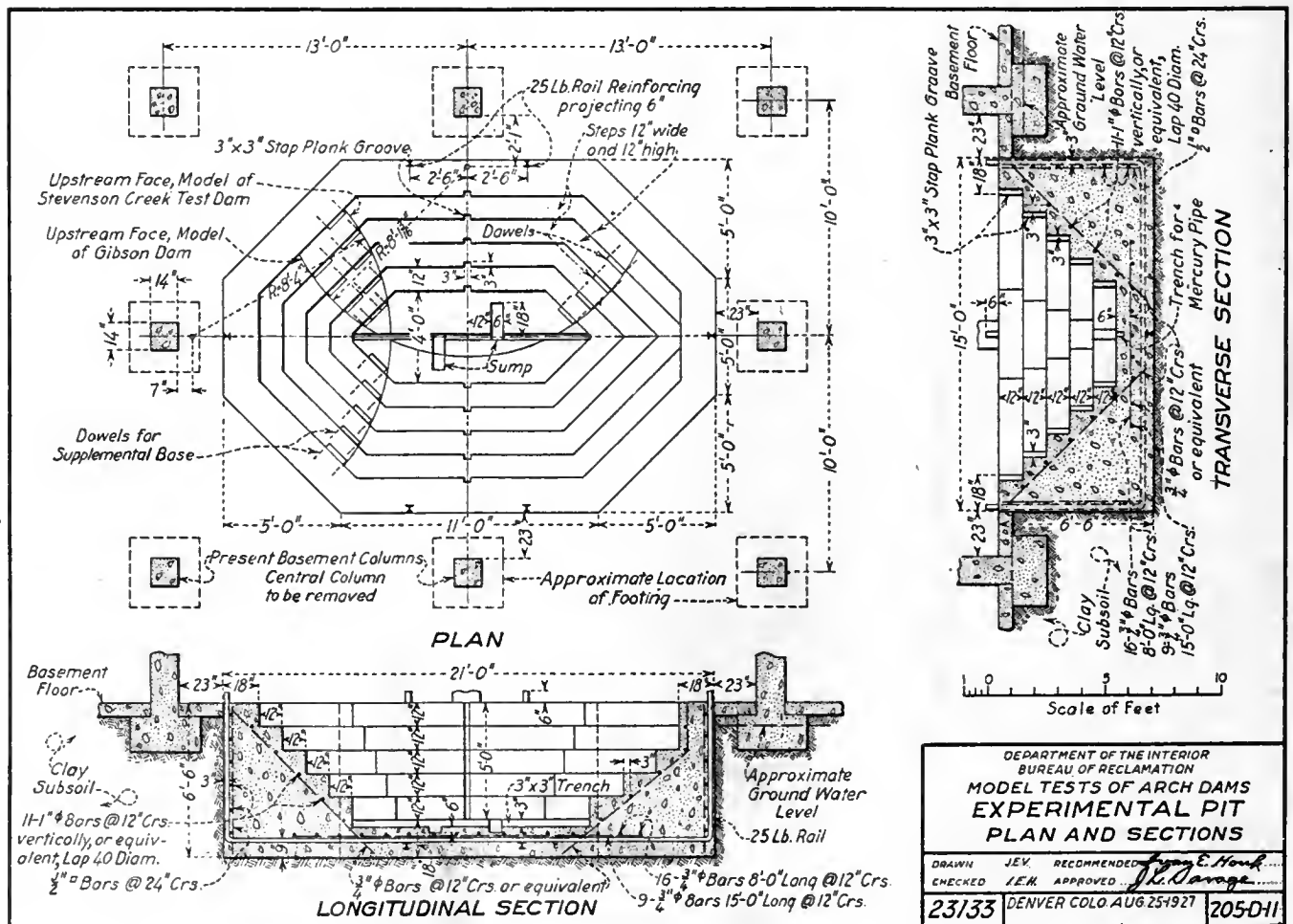
*By Ivan E. Houk, Research Engineer, Denver Office, Bureau of Reclamation*

ONE of the most important secondary investigations being conducted by the Bureau of Reclamation at the present time is the experimental work on small-scale models of arch dams. It is expected that the investigations will furnish definite information as to the safety of arch dams already built or now being constructed by the Bureau of Reclamation, demonstrate the feasibility or infeasibility of using small-scale models in planning costly arch-dam structures, and provide the complicated technical data needed for comprehensive engineering studies of arch dams. It is anticipated that the experimental data obtained will make possible a more exact, and consequently a more economic, design of arch-dam structures, thus tending to permit the development of proposed irrigation, water power, and other engineering projects not heretofore considered financially feasible.

The model experiments are being carried on at Boulder, Colo., in cooperation with the University of Colorado and the Engineering Foundation Arch Dam Committee. In fact they may be said to constitute one part of the comprehensive research work being carried on by that committee. A subcommittee on model tests, appointed by chairman Charles D. Marx of the main committee, is cooperating with the representatives of the Bureau of Reclamation in outlining, supervising, and conducting the investigations. This subcommittee is composed of Chief Designing Engineer J. L. Savage, of the Bureau of Reclamation, chairman; Consulting Engineer D. C. Henny, of Portland, Oreg.; Consulting Engineer F. A. Noetzli, of Los Angeles, Calif.; Engineer-Physicist W. A. Slater, of the Bureau of Standards; Prof. Raymond E. Davis, of the University of California; Prof. George E. Beggs, of Princeton University; Profs.

F. R. Dungan, C. L. Eckel, and H. J. Gilkey, of the University of Colorado; Engineer Julian Hinds, of the J. G. White Co. of Mexico, formerly of the Bureau of Reclamation; and the writer.

The experiments will be made in the basement of the testing laboratory at Boulder, where the testing equipment, instruments, and other experimental apparatus of the university will be available for the use of the testing staff. An experimental concrete pit, with massive, heavily reinforced sidewalls and floor, has been built below the floor of the basement to serve as a site for the model dams. The pit has a depth of 5 feet; a maximum inside length of 18 feet, and a maximum inside width of 12 feet. One of the accompanying illustrations shows the plan of the pit, a longitudinal cross section along the center line, and a transverse cross section through the center. The octagonal, stepped design





will permit the testing of models of practically any shape, symmetrical or nonsymmetrical, and of practically any size not exceeding the maximum inside dimensions of the pit.

#### MODELS OF DIFFERENT MATERIALS

Careful study has been given to the possibility of using different materials in building the models. Hard rubber, celluloid, plasticine, gypsum, cast-iron blocks, and other materials have been considered as possible substitutes for concrete, the material now invariably used in the construction of full-size dams. Very careful study has also been given to different methods of loading the models, such as loading by springs, by mercury, by water, by water pressure transmitted through inclosed horizontal lengths of rubber hose laid along the upstream face of the model, etc. The conclusions reached were that the first models should be built of concrete, that they should be tested under triangular loads obtained by holding a film of mercury against the upstream face of the model, and that experiments with other materials and

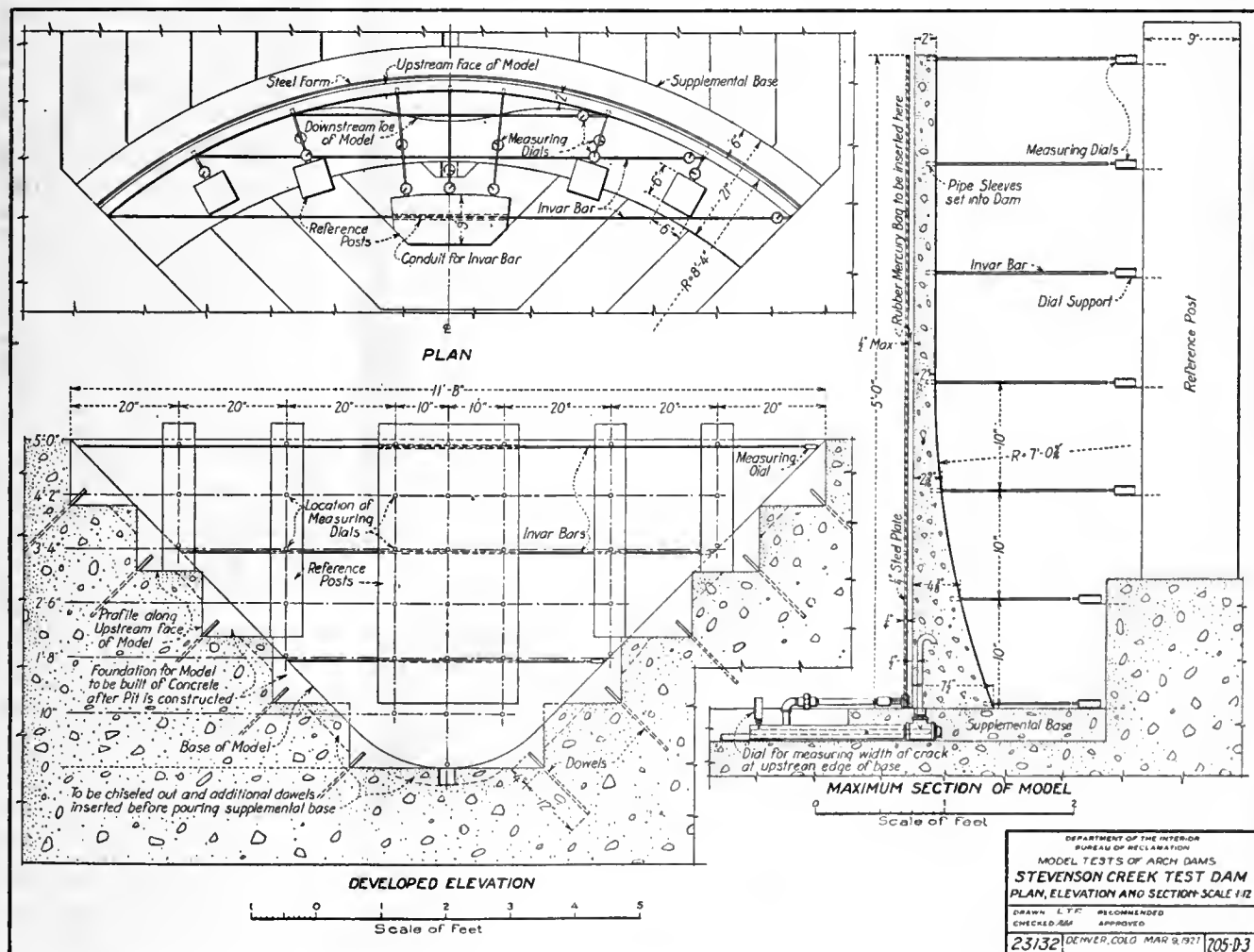
other methods of loading should be deferred until the results of the first tests are available.

The first experiment to be conducted will be an investigation of a  $\frac{1}{12}$ -scale model of the Stevenson Creek Test Dam, the 60-foot symmetrical arch dam which was built by the Engineering Foundation Arch Dam Committee for the purpose of studying the action of arch dams. The model will be 5 feet high, 11 feet 8 inches long, 2 inches thick at the top,  $7\frac{1}{2}$  inches thick at the bottom, and curved on a radius of 8 feet 4 inches. It will have the same V-shape as the Stevenson Creek Test Dam and will be built in one end of the pit where the arch elements can abut against the side walls at an angle of approximately 90 degrees. A plan, elevation, and vertical cross section of the model at the location of maximum height are shown in one of the accompanying drawings. Arrangements are being made for a shipment of fine aggregate from the Stevenson Creek site to Boulder, for use in building the model, so that the concrete in the model will be very nearly identical with that used in the actual dam.

#### LOADS AND MEASUREMENTS

Loads on the model will be obtained by forcing mercury into a rubber bag held against the upstream face of the model. The rubber bag will be held in place by a  $\frac{1}{4}$ -inch sheet steel form, curved to the same radius as the upstream face. Heavy timber bracing will hold the form in position, and air pressure will be used to force the mercury from the supply tank into the rubber bag. Since mercury is 13.6 times as dense as water, a dam 5 feet high, loaded with mercury, will be subjected to the same pressure at the bottom as a 68-foot dam loaded with water.

Very careful measurements will be made of the movements of the model when the load is applied. Deflections of the downstream face will be observed at approximately 40 points, by means of dials reading directly to one ten-thousandth of an inch. Invar steel rods, whose lengths do not change with variations in temperature, will transmit the movements of the downstream face to the measuring dials, the rods being arranged as shown in the accompanying plans. The movement of the



model at the upstream edge of the base will be measured at the crown section where the formation of a crack is anticipated. Movements of the abutments will be observed at three elevations corresponding to the elevations at which similar measurements were made at the Stevenson Creek Test Dam. Strains at the downstream face of the model will be measured with the optical strain gage developed by Doctor Tuckerman, of the United States Bureau of Standards. Repeated observations with this instrument, made by different persons, have demonstrated its ability to measure strains in a 2-inch gage length with an accuracy of one four-millionth of an inch. Investigations are being made to determine the feasibility of using this instrument in measuring other deformations of the model, such as changes in length of mid-ordinates in a 10-inch chord length, angular rotation of different elements of the model, deflections near the base of the model, etc.

The decision to build a model of the Stevenson Creek Test Dam for the first experiments was based on the fact that complete data regarding deflections, strains, bending, movement of abutments, temperature effects, etc., are available for that structure, the first series of experiments by the Arch Dam Committee having been completed and the data now being practically ready for publication. It is expected that a comparison of the experimental data obtained on the model with that obtained on the actual dam will determine the relations between a small-scale concrete model loaded with mercury and a full size structure loaded with water. These relations can then be used in interpreting the results of subsequent model tests. They will also be of value in deciding whether it is advisable to conduct experiments on models built of other materials.

#### DETERMINATION OF LOAD DISTRIBUTION

The action of arch dams is a complicated problem, more complicated than the action of arch bridges, because of the fact that arch dams are restrained along the irregular profiles of the foundations and abutments instead of along two parallel sections as in the case of arch bridges. The assumption usually made in the design of arch dams is that part of the horizontal water load is carried by vertical cantilever action, and the remaining part by horizontal arch action, the distribution of loads being based on the criterion that the deflection of the arch elements must equal the deflection of the cantilever elements at corresponding points. The usual procedure in determining the

load distribution has been to bring the arch and cantilever deflections together at the crown section of the dam, and then to assume that, for such a distribution, an equally satisfactory agreement of deflections exists at other parts of the structure. During the last few years the Bureau of Reclamation, in preparing designs for costly arch dams, has been continuing the mathematical studies until the arch and cantilever deflections are in agreement entirely around the dam, at from 6 to 10 different elevations and from 10 to 20 vertical cross sections. If the entire water load can be accounted for by the arch and cantilever elements, without producing excessive stresses, suitable allowances being made for temperature variations, the structure is considered safe. If not, the design must be modified until the excessive stresses are reduced to allowable limits.

The accuracy of the fundamental assumptions made in the design of arch dams, the effect of variations in shape of cross section on the load distribution, the effect of restraint along the irregular profile of the foundation and abutments on the mathematical formulas used in the design, the effect of movements of bed-rock, flow of concrete, temperature variations in the body of the dam, etc., can not be satisfactorily determined by mathematical investigation. It is not known that they can be satisfactorily determined from a study of the action of models. The ideal solution would be an elaborate system of measurements, such as was made at the Stevenson Creek Test Dam, on several full size dams of different design, built in canyons having different shapes of cross section and different rock formations. Such an ideal solution is not practicable because of the excessive cost involved. However, it is believed that an adequate solution can be obtained through a careful study of the action of small-scale models in conjunction with

suitable mathematical treatment, the comprehensive Stevenson Creek Test Dam data, and such experimental observations as it is practicable to secure on other full-size dams.

#### USE IN BOULDER CANYON DAM DESIGN

When the experiments on the Stevenson Creek Test Dam model are completed it is proposed to investigate the action of a model of the Gibson Dam now being built on the Sun River project of Montana. Since the valley at the Gibson site has a relatively wide cross section, definitely different from the narrow V-shaped section at the Stevenson Creek site, it is expected that a definitely different load distribution will be found. Computations made in designing the Gibson Dam indicate that approximately three-fourths of the load will be carried by gravity (cantilever) action, whereas, in the case of the Stevenson Creek Test Dam the greater part of the load was carried by arch action.

It is anticipated that the technical data obtained in the experiments with the Stevenson Creek Test Dam and Gibson Dam models will furnish a basis for the utilization of arch elements in designing the Boulder Canyon Dam. It is also expected that such utilization of arch principles in the Boulder Canyon design will result in a comparatively great saving in cost over the tentative gravity designs made in the past. The experience gained in testing the Stevenson Creek and Gibson Dam models should also indicate the proper procedure to follow in building and testing a model of the proposed Boulder Canyon Dam. Doubtless many special problems, which can not now be foreseen, will arise during the prosecution of the work. It is hoped that they all may be satisfactorily solved.

The institution of a comprehensive research program is always the most critical period. Many worthy investigations have been seriously handicapped by getting started in the wrong direction. Although an actual model test has not thus far been made it is felt that definite progress in the right direction has been achieved in spite of the various delays that have been necessary. Plans for the tests have been thoroughly worked out, an experimental pit has been built, a supply of mercury has been obtained, the steel form for the upstream face of the Stevenson Creek Test Dam model has been purchased, advertisement for bids on instruments has been issued, and various miscellaneous supplies have been acquired. It is hoped that the first model dam can be constructed in the near future and that the experimental data obtained will come up to our expectations.

### Start Potato Harvest on Minidoka Project

With approximately 10 cars shipped from each side of Snake River, the potato season opened recently on the Minidoka project, Idaho. Shipments were to Chicago and the southeast. As is the case with all crops on the project, potatoes started out with a promise of both quality and yield above the average. The total tonnage was estimated in some quarters at 40 per cent greater than that of last year. Prices at the beginning of shipments were around 95 cents sacked, delivered at the cars.

## *Proposed Contract between the United States and American Falls Reservoir, District No. 2, for the Construction of the Gravity Extension Unit of the Minidoka Project*

NEAR Gooding, Idaho, there is a large body of land that has been irrigated for a number of years from the Big Wood and Little Wood Rivers. The water supply is entirely inadequate for the irrigation of the land, even when reinforced by stored water from Magic Reservoir which has been constructed to supplement the natural flow of the two rivers.

By the act of January 12, 1927, 44 Stat. 934, Congress came to the rescue by appropriating \$400,000 for "investigation and construction of the gravity extension unit" of the Minidoka project, the appropriation act containing the following proviso: "Provided, That none of the said sum of \$400,000 shall be available for construction until a contract or contracts shall be made with an irrigation district or districts embracing said unit, which, in addition to other conditions required by law, shall require repayment of construction costs as to such lands as may be furnished supplemental water, within a period not exceeding twenty years from the date water shall be available for delivery."

Investigations which have been made by the Government show that this land can be irrigated by the construction of a canal approximately 70 miles long, taking out from the Snake River above Milner Dam. The canal will approximately bisect the area that had been irrigated from the Wood Rivers and leave about one-half of the old irrigated lands dependent solely upon the Wood River supply, the remaining one-half of the old lands being susceptible of irrigation by gravity from the proposed Government canal. The plan is to concentrate the entire available Wood River supply upon the old lands above the Government canal. The construction of the Government canal will permit the irrigation of a large area of new land, now in Government ownership.

Milner Dam, referred to above, is owned by private parties and operated as the diversion dam for the irrigation of large tracts of land not under a Government project. The proposed Government canal will divert from the backwater above Milner Dam. The Government water supply for the Gooding lands will be obtained from water stored in the Government reservoir at American Falls, a considerable distance upstream from Milner. The State laws give the right to utilize the river for the carriage of stored water, and the diversion of such water supply above

Milner Dam will in no way affect the use of the dam by its owners for the diversion of their water supply.

If the owners of Milner Dam should make a claim for compensation for the use of their dam, the matter seems to be one for the district to handle, and article 21 of the proposed contract with the irrigation district embracing the land of the Gravity Extension Unit reads as follows: "The district agrees to assume and pay, and herein and hereby now assumes and agrees to pay, all obligations and claims of every kind, nature, and description, if any, which may arise and accrue in favor of any or all the legal or equitable owners of the Milner Dam by reason of the diversion of water through the main canal as herein provided, and to keep the United States harmless therefrom."

A part of the area of the old irrigated land is held in large ownerships, and under the reclamation laws the United States is unable to furnish water for the irrigation of more than 160 acres of privately owned land in the ownership of a single person. The contract therefore provides a method for the breaking up of such large ownerships into smaller holdings that may be irrigated under the Federal reclamation laws. The land is to be appraised, and a copy of the appraisal is to be attached to the irrigation district contract when executed. The large landowners are to execute individual contracts by which they agree to dispose of the excess area for sums within the appraised valuations, the excess areas to be so disposed of within three years after water from the Minidoka

project is first delivered to the Gravity Extension Unit. If the landowner fails to so dispose of his land within this three-year period the Secretary of the Interior is empowered to sell the excess land for the best price obtainable, and in tracts irrigable under a Federal reclamation project. The United States is not to be obligated to make any expenditures toward the construction of the Gravity Extension Unit of the Minidoka project until at least 75 per cent of the area of the irrigable excess land of the said unit is covered by recordable contracts binding the owners thereof to convey the same at the maximum prices fixed in an appraisal approved by the Secretary.

The contract also provides for the appraisal of the new land of the project, without regard to any enhancement of value due to the proposed construction. In case of sales at prices in excess of the appraised valuation, one-half of the excess is to be paid upon the charges for the Government water right for the tract so sold. Thus a speculative enhancement of the value of the land will hasten the time when the project charges are paid.

By the terms of the proposed contract the United States is to expend a maximum of \$5,200,000 for the construction of the main canal referred to above, laterals, structures, and drains, and the district is to pay to the United States a maximum of \$2,500,000 for storage rights in American Falls Reservoir, already built. The district is to receive a four-seventenths share in the reservoir, estimated to be equivalent to 400,000 acre-feet of storage capacity. The "old" landowners are to pay their construction charges within 20 years, as required by the act of Congress quoted near the beginning of this article, and the owners of "new" land are to be permitted to make payment of their construction charges within 40 years, this being allowed under the act of Congress of May 25, 1926.

The "old" land has largely been irrigated under canals operated by the Big Wood Canal Co. and this company is to continue such operation after the Government project is completed. Provision is made for a contract between the company and the district to this end.

The form of contract referred to in this article was approved by the Interior Department on September 9, 1927, and the district has called an election to ascertain if the contract will be adopted by the landowners.

### *Seven State Governors Discuss Colorado River*

From August 22 to September 1, the governors of the seven Colorado River basin States, together with their advisers, were in attendance at a conference at Denver for the purpose of arranging an agreement between the three lower basin States for the allocation of water and power resources proposed to be set aside for those States by the Colorado River compact. For a few days prior and subsequent to the official session official meetings were also held. No agreement was reached and the conference was adjourned to meet again at Denver on September 19, when this issue of the NEW RECLAMATION ERA went to press.

# Transfer of Equipment and Supplies on the Reclamation Projects<sup>1</sup>

By S. O. Harper, General Superintendent of Construction

**D**URING the past two or three years the situation relative to the plant and equipment on most of the projects of the Bureau of Reclamation has radically changed. The principal reasons for this change are the completion of the major program of drainage construction on many of the projects, the policy recently adopted of contracting all large construction work instead of carrying it on by Government forces, and the turning over of a number of the projects to the water users for operation. These conditions have greatly reduced the requirement for new plant and equipment, calling for a policy of liquidation rather than expansion, and making it advisable to supply requirements for new items by transfer wherever possible, instead of through purchase.

In furtherance of this policy a system has been adopted in the Denver office for a thorough comparison of all requests for purchases of new equipment or supplies with the list of articles available for transfer, in order that no opportunity to supply requirements by transfer may be overlooked.

Project purchase requests received in the Denver office are first routed to the chief clerk, who passes them on to the property clerk for comparison with the available transfer lists. If the requirement can be filled by transfer, action is taken accordingly. If no suitable articles are available for transfer, this information is noted on the purchase request with a stamp, and it is then passed on to the general superintendent of construction for approval. If the purchase appears proper and the articles desired are necessary in connection with the operations of the project, the purchase is approved and the papers are routed to the purchasing department for appropriate action.

If there is nothing listed in the equipment catalogue or records in this office indicating that the requirements can be met by transfer, but at the same time there is reason to believe that some of the articles—particularly materials and supplies of which there is no record in this office—are available on certain of the projects, the purchase request is approved for advertisement by the purchasing department, with instructions not to place the order until finally cleared after circularization of the projects which may be able to supply the articles in question. The advertisement is issued in the regular

way, but when bids are opened replies from the projects are at hand, and the purchase order is placed for only those items that are not available for transfer.

## THE EQUIPMENT CATALOGUE

The equipment catalogue is intended to keep the projects advised of the principal items of equipment available for transfer. It is not possible, however, to keep this catalogue absolutely up to date, and there are also many items of equipment which may be made available for transfer from time to time which are not listed in the catalogue. The projects should therefore not reach the conclusion that because a certain article is not listed in the catalogue it can not be supplied by transfer, and it is important that no steps be taken by the projects to purchase equipment or supplies, except in the case of emergency, without submitting a statement of the requirements or a purchase request to the Denver office.

By far the largest investment of the bureau in one class of equipment is in drag-line excavators. Last spring, before any equipment was turned over to the water users, the bureau owned 71 drag-line excavators, with an appraised value of \$475,000, and which originally cost \$1,390,000. In view of the fact that many of these machines were idle, with no further work in prospect, a particular effort has been made during the past year to dispose of them where possible and also to fill all requirements for repair parts by transfer. The market for second-hand drag lines, however, has not been favorable, and, owing to the fact that new machines have been greatly improved and also lowered in price, it is very difficult to dispose of our second-hand drag lines at prices which will return the book value.

During the past year only two drag lines have been sold, though sales have also been made of three large electric shovels at McKay Dam and Yakima, and 14 drag-line excavators of various sizes have been transferred to the water users on projects where the operation has been turned over. At this time the bureau owns 55 drag-line excavators, about 40 of which are in more or less regular use. Some of the older drag lines are obsolete, and there is little or no chance to realize any material return through their sale. The only safe procedure is to see that these machines are depreciated entirely to the worth before operations are suspended.

## FIXING THE TRANSFER PRICE

The most prolific sources of misunderstanding in connection with the transfer of equipment and supplies is the fixing of the transfer price. This office must depend upon statements furnished by the project superintendents of the condition of the equipment, and unless these statements are accurate transfers will sometimes be ordered of articles which are not worth the freight. Inequalities in transfer prices can of course be settled by this office, and if an article is not as represented the project transferring it is expected to stand the cost of putting it in condition or to reduce the transfer price to a fair value. If the article transferred proves unsuitable, or if the transfer price appears unreasonable, do not ship it back, as has been done in one or two cases, but refer the case to the Denver office, and proper adjustment in the price will be made.

Every precaution is taken to avoid transfer of equipment or supplies which are not worth the transportation charges, and in order to control this situation as closely as possible a form has been prepared for use in this office, on which the following information is shown in connection with all transfers: Estimated current market price of article if purchased new; freight from purchase point to destination; and total cost f. o. b. destination. Below this is shown the estimated freight from the transfer point to destination, the maximum permissible transfer value, which, in the case of new articles, is based on the cost of similar articles f. o. b. project if purchased in the open market, and the original cost to the issuing project. In the case of new articles of equipment or supplies, transfer will not ordinarily be approved at a price which will return the transferring project less than 75 per cent of the original cost, especially where the articles are standard and can be sold locally. In the case of used equipment this limit, of course, does not hold, as the transfer price should be fixed on the value of the equipment to the receiving project, taking into consideration its condition and the service it has given.

The general principle followed in connection with fixing transfer prices is that the transferring project shall absorb the freight and sufficient depreciation so that the receiving project shall not pay more than the current market price. If this results in a lower return to the transfer-

<sup>1</sup> Address at the Denver Conference, March 18, 1927.



ring project than could be obtained by sale in the local market, transfer should not be made.

### HOW THE ACCOUNT STANDS

At the beginning of the calendar year 1926 the total balance in plant and equipment accounts on all projects was \$1,564,184. This was reduced during the year by depreciation charges in the amount of \$155,892, by sales amounting to \$89,245, and by transfers to the water users of property valued at \$80,152, leaving a balance at the end of the year of \$1,228,895. Excluding the Riverton project, which accounts for \$537,212 of this amount, the plant and equipment accounts on practically all of the other projects are now in healthy condition, the balance having been reduced from \$995,359 to \$691,683. Inventory accounts are also generally in good condition, the total having been reduced during the year from \$729,886 to \$553,335.

The total transfers between projects during the calendar year 1926 amounted to \$37,654. It is estimated that the cost of transferred articles if purchased new would amount to about \$85,000. The total sales effected during the year amounted to \$89,245.

A number of problems have arisen in connection with the turning over of equipment and supplies to the water users on the various projects where the operation and maintenance has been transferred. The first contracts executed for the transfer of project works provided that lists of all equipment and supplies, with the book value of each item, should be furnished the water users, and from this list they were permitted to select such articles as they desired, the balance remaining the property of the Government. Manifestly, this was not a desirable procedure, as it might leave on the hands of the Government, without definite provision for securing repayment, such property as the water users did not desire to take.

In order to avoid loss to the reclamation fund, steps were taken to reduce the book value of all property on those projects where this condition held in order that there would be no question that the equipment retained by the Government could be sold at a sufficient price to return the investment. In view of the conservative values fixed for the property on the projects in question, the water users in nearly all cases have elected to take over the entire list, evidently with the idea that the payment for the property is spread over a long period of years, and the property when in the hands of the district has an immediate cash value, which the districts can realize by selling such articles as they do not need.

### PROTECTING THE GOVERNMENT'S INTERESTS

In the later contracts the provisions covering transfer of equipment have been modified so as to compel the water users to either take over all equipment at the book value or to assume the shrinkage between the book value and the sale price of any equipment which is retained and later disposed of by the bureau. This procedure protects the interests of the Government and at the same time avoids the necessity for reducing the appraised value of the equipment to an unreasonably low figure to insure that the water users will take it. On projects where the water users are taking over the operation of a part of the system, but the bureau continues to operate and maintain reserved works, particular care should be taken not to transfer any equipment or supplies to the water users which will have to be replaced by purchase in the future.

The principal points which I wish to emphasize in connection with property on the projects is the necessity for keeping the plant and equipment as well as the inventory accounts in healthy condition by disposing of all surplus property whenever opportunity arises. If equipment is on hand for which it is certain there will be no further use, the sooner it is disposed of the better. It almost invariably happens that the longer an article is held the less return will be realized from its sale, as it not only depreciates in value from year to year by the action of the elements, but in the case of much of our equipment it also rapidly becomes obsolete. In view of the decline in construction activities by Gov-

ernment forces, it is the policy of this office to accept any reasonable offer for surplus second-hand equipment, even though it will bring much less than it would if transferred between projects.

### Oldest Standing Cabin In The Yakima Valley

The accompanying illustration, from a photograph sent to the Washington office by Superintendent Lytel of the Yakima project, Washington, shows the oldest standing building in the Yakima Valley, located on what is now known as the Sawyer ranch on the Sunnyside division of the project.

From the best information obtainable, the cabin was built in 1864 by a settler named J. P. Mattoon, the land on which it is standing being homesteaded at that time by Mr. Mattoon. The cabin is constructed of cottonwood logs, chinked with native clay.

The locality in which the cabin is built was known originally as Parker Bottom, a rather interesting spot historically, as one William Moore built there in 1847 the first house constructed by white men west of the Columbia River and east of the Cascade Mountains, in the State of Washington. This house was built within a few feet of the present cabin, but nothing remains of it to-day except an old wooden anvil block. In 1849 a Catholic mission was also built within a few hundred feet of the cabin.

The land on which the cabin stands is owned by Mr. W. P. Sawyer, who acquired it in 1890 and built himself a very fine modern, up-to-date residence on the site of the old mission house.



Oldest cabin in the Yakima Valley, Washington



## The McKay Creek Bird Refuge, Umatilla Project, Oregon

By E. A. Goldman, in charge, Game and Bird Reservations, Bureau of Biological Survey, U. S. Department of Agriculture

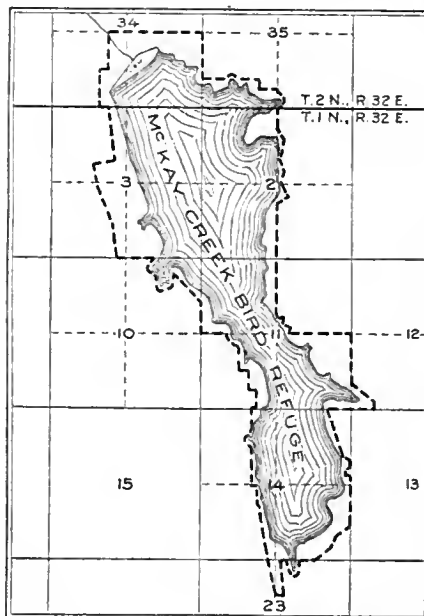
THE McKay Creek Bird Refuge, created by Executive order June 7, 1927, embraces the McKay Reservoir, and a narrow strip of surrounding land located about 5 miles from Pendleton in northeastern Oregon. The great dam constructed by the Bureau of Reclamation, and forming the reservoir, is 160 feet high and 2,600 feet long. Behind its massive bulk is storage capacity for 75,000 acre-feet of water, which will bring fertility to a large territory and under protection a host of water-loving birds will be benefited.

The refuge as a whole contains 1,813 acres in an unusually favorable setting, as it is surrounded by an extensive wheat-growing section, in a region with few water areas attractive to wild fowl. Ducks, geese, and other waterfowl can not thrive either on water or food alone, but the two in convenient combination are irresistible. Fall rains filling small depressions in and about stubble fields will make them ideal feeding grounds for ducks and geese which can resort to the refuge for protection. Where reservoirs for the storage of irrigation water have precipitous shores, or are surrounded by broad belts of sterile land, their value to waterfowl is comparatively limited, but it is believed that the McKay Creek Bird Refuge will be worthy of the name.

It is hoped that conditions may here favor the breeding of a considerable number of birds, but no storage reservoir with wide fluctuations in water level and rapidly changing depths tending to prevent the growth of aquatic plants furnishing food can be as attractive to breeding waterfowl as a permanent marsh or shallow water area with a more nearly stabilized depth.

The great value of the refuge seems likely to be as a resting ground for very large numbers of geese and ducks that finding sufficient water may, with protection, remain to feed in the surrounding grainfields throughout much of the fall, winter, and spring seasons. During the open season for hunting from October 1 to January 15 great numbers of geese, mallards, pintails, and other ducks attracted to the general section should afford excellent sport in passing from the reservation to the feeding grounds. Without the protection of the refuge, however, the visiting migrant would soon be forced to resume their flight in search of a congenial wintering place. Oregon

sportsmen have shown their appreciation of the importance of affording a safe resting place for migratory wild fowl by favoring the establishment of the refuge.



The Executive order creating the refuge is as follows:

It is hereby ordered that parts of secs. 2, 3, 10, 11, 12, 14, and 23, T. 1 N., R. 32 E., and of secs. 34 and 35, T. 2 N., R. 32 E., W. M., Oregon, as segregated by the broken line upon the diagram hereto attached and made a part of this order, be and the same are hereby reserved and set apart for the use of the Department of Agriculture, as a refuge and breeding ground for birds.

All of the lands involved have been purchased, or will be purchased, for reclamation purposes in connection with the Umatilla Project, Oregon, and are primarily under the jurisdiction of the Department of the Interior. The reservation of these lands as a bird refuge is subject to the use thereof by said Department, including leasing for grazing, and to any other valid existing rights.

It is unlawful for any person to hunt, trap, capture, willfully disturb or kill any bird of any kind whatever or take the eggs of such birds within the limits of this reservation, except under such rules and regulations as may be prescribed by the Secretary of Agriculture. Warning is expressly given to all persons not to commit any of the acts herein enumerated under the penalties provided by section 84, U. S. Criminal Code, approved March 4, 1909 (35 Stat. 1088), as amended by the act approved April 15, 1924 (43 Stat. 98).

This reservation shall be known as the McKay Creek Bird Refuge.

## President Coolidge Gets Shoshone Honey

Mr. Val Kuska, colonization agent of the Chicago, Burlington & Quincy Railroad Co., has sent us a letter from F. G. Gurley, general superintendent of the railroad at Alliance, Nebr., stating that at the time of the recent visit of the President and Mrs. Coolidge to Yellowstone National Park, the water users at Powell on the Shoshone project, Wyoming, put several 10-pound pails of strained honey on the President's train and also distributed cards reading as follows:

POWELL  
The Center of Wyoming's Garden Spot  
on the Shoshone  
Reclamation Project  
Built by Uncle Sam

There was produced and shipped from this division of the project, comprising 32,000 acres, in 1926, the following:

Sugar beets (carloads).....	529
Alfalfa meal (carloads).....	414
Baled hay (carloads).....	1,081
Potatoes (carloads).....	256
Dried beans (carloads).....	18
Honey (carloads).....	4
Dressed turkeys (carloads).....	5
Butter (pounds).....	162,000
Ice cream (gallons).....	8,000
Dressed chickens.....	25,000
And enough other agricultural products and stock to make a total shipment of (carloads).....	2,629

## Million Dollar Crop For Tieton Orchardists

A recent issue of the Yakima Morning Herald states that growers and packers in the Tieton-Cowiche district, which covers about 2,500 acres of apple orchards between and around the towns of Tieton and Cowiche on the Tieton division of the Yakima project, Washington, are making preparations for handling a million-dollar apple crop. Conservative estimates place the total pack of the district at 1,000 carloads of 756,000 boxes. Allowing an average of \$1.50 a box, the million-dollar mark for the crop will easily be reached.

In this section of the Yakima Valley the apple crop will exceed that of last year by 10 to 20 per cent. The crop will be handled at seven packing houses: The Horticultural Union, Tieton Fruit Growers, Cowling & Young, and the Cowiche Cold Storage Co. at Tieton; and C. M. Holtzinger, Cowiche Fruit Growers, and the Big Y at Cowiche.

With a short apple crop this year throughout the country, affairs look rather auspicious for a top market for this product of the Yakima project.

## Organization Activities and Project Visitors

THE President and Mrs. Coolidge paid a visit to the Belle Fourche project, S. Dak., on September 1. This is the first Federal irrigation project which has enjoyed the honor of a visit by President Coolidge, an account of which will be found on another page.

Secretary Work, accompanied by Governor Fisher, of Pennsylvania, was a recent visitor to the Belle Fourche project. According to reports from the project the Secretary was pleased with his inspection of the economic and agricultural situation and with the new industrial development. He appeared particularly pleased with the financial feature which showed that all assessments due the Government have been paid.

Dr. Elwood Mead, Commissioner of Reclamation, who left for Palestine on August 1 for a study of and report on the reclamation and settlement work in that country under the Zionist Organization, left Jerusalem on September 12 and expects to arrive at Boston on the *President Adams* on October 4.

Word was received by the Washington office on August 31 of the sudden death on that date, on the Uintah Indian Reservation, Utah, of Ray P. Teele, of the Bureau of Agricultural Economics, Department of Agriculture. At the time of his death Mr. Teele was engaged with Porter J. Preston, superintendent of the Yuma project, and Charles A. Engle, of the Bureau of Indian Affairs, on an engineering and economic survey of the reclamation projects.

Maurice J. Ricker, photographer in the Washington office, was in the South during the first three weeks of August taking motion and still pictures on the projects selected by the States of South Carolina, Georgia, Alabama, Mississippi, and Tennessee for a study of opportunities for planned group settlement. He left the Washington office on August 24 to join Mr. Kreutzer, director of reclamation economics, on the Minidoka project, Idaho, to obtain motion pictures there and on the Shoshone, Riverton, Belle Fourche, and North Platte projects for a reel illustrating settlement activities.

Charles A. De Kay, engineer draftsman, has been transferred from the Denver office to the field office at Stony Gorge, Orland project.

Recent visitors on the Orland project included George C. Kreutzer, director of reclamation economics; R. E. Kelly, manager of the industrial department, Southern Pacific Co.; E. F. Steuwe, associate editor, Bureau of News, Southern Pacific Co.; and Phillip Schuyler, editor of Western Construction News.

District Counsel J. R. Alexander attended the two mass meetings on the Grand Valley project held for a discussion of the repayment contract.

An inspection of the lands on the gravity extension unit of the Minidoka project was made recently by George C. Kreutzer, director of reclamation economics; B. E. Hayden, and W. W. Johnston, reclamation economists; and W. J. Martin, assistant supervisor of agriculture, Union Pacific System.

A board of engineers consisting of A. J. Wiley, D. C. Henny, W. H. Nalder, George O. Sanford, and Ralph Lowry, convened recently at Gibson Dam, Sun River project, to inspect and report on various features of the work in connection with the construction of the dam.

Prof. O. L. Waller, engineering dean of the State College of Washington, and H. W. Lawler, general superintendent of the Utah Construction Co., were recent visitors at Gibson Dam, Sun River project.

Rhea Luper, State engineer of Oregon, and W. G. Ide, manager of the Oregon State Chamber of Commerce, visited the Vale project during the month.

G. C. Wright, Bureau of Plant Industry, United States Department of Agriculture, spent a day on the Klamath project looking over the project and taking samples of drain and irrigation water at various points.

A congressional delegation, consisting of Hon. Addison T. Smith, Idaho; Hon. Charles E. Winter, Wyoming; Hon. Philip D. Swing, California; Hon. Samuel S. Arentz, Nevada; Hon. John C. Allen, Illinois; Hon. William C. Lankford, Georgia; Hon. James B. Reed, Arkansas; Hon. Miles C. Allgood, Alabama; Hon. John W. Summers, Washington; Hon. W. M. Whittington, Mississippi; Hon. Stewart H. Appleby, New

Jersey; Hon. Albert Johnson, Washington; and Hon. Nicholas J. Sinnott, Oregon, arrived in Klamath Falls, Oreg., on August 27, and spent several hours looking over the Klamath project and discussing its problems.

A. J. Wiley, consulting engineer, expects to sail from Boston, Mass., on October 12 for India in connection with plans for the construction of several high dams contemplated by the Provincial Government. Mr. Wiley will be absent from the United States on this assignment until February, 1928.

W. R. Kepler, hydraulic engineer for the Newport News Shipbuilding & Drydock Co., spent several days at the Minidoka Dam testing the new turbine for unit No. 6 of the Minidoka power house.

F. T. Crowe, former general superintendent of construction, was a recent visitor at Minidoka Dam, Minidoka project.

Master Sergeant Dahlgren, United States Army, was on the Yuma project recently in connection with aerial photographs of the Colorado River.

J. B. Bond, former superintendent of the Boise project, who is now connected with the J. G. White Co. on irrigation work, was a recent visitor at the project office.

William Lehman, rodman, and B. A. Hall, assistant engineer, at American Falls Dam, have been transferred to the Owyhee project.

George C. Imrie, assistant engineer, formerly office engineer at American Falls, has been designated inspector of work on the bridge over the dam.

Recent visitors to the Milk River project included David Scott, agriculturist, Utah-Idaho Sugar Co.; Heber Austin, representative from the Mormon Organization, Idaho Falls; E. C. Leedy, C. D. Greenfield, Leonard Ball, and Dan Willard, agricultural development agents, Great Northern Railway; and G. L. Liebault, State horticulturist, University of Louisiana.

## NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, under the authority of the Commissioner of Reclamation and the Secretary of the Interior.

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation. Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C.

Dr. Kurt Schneider, of the agricultural college at Ronn-Poppelsdorf, Germany, was on the Yakima project during the month to obtain information on irrigation farming.

Charles Bartholet, assistant to the State Supervisor of Hydraulics, and C. E. Douglass called at the Yakima project office recently relative to taking preliminary steps in connection with the adjudication of the waters of Yakima River.

H. C. Austin, August Saunders, Leonard Ball, and K. L. Molin, representing the Utah-Idaho Sugar Co. and the Mormon interests, visited the Sun River project during the month and went over the irrigated lands. All seemed very



Advertising the Riverton project, Wyoming, at tourist camp

favorably impressed with the opportunities offered on the project.

S. O. Harper, general superintendent of construction, spent two days on the Newlands project principally in connection with an inspection of the Truckee Canal tunnels, which are to be repaired this fall and winter. He was accompanied by the entire district board and Project Superintendent Stuver.

E. W. Kronquist, engineer, Bureau of Indian Affairs, visited the Newlands project recently to collect data regarding the Paiute Indian Reservation for the Board of Survey and Adjustment on Indian Projects.

Andrew Weiss, former superintendent of the North Platte project, and at present resident engineer on the Don Martinez

project of Mexico; Jesus Oroposa, superintendent of reclamation, national committee of irrigation of Mexico; and A. E. Kocher, assistant chief of agronomics, spent several days on the Carlsbad project going over the project system.

The kind of an animal you raise and the price it brings depend on its breeding.

### Project Water Supply

*WEATHER for August in Colorado, Wyoming, Montana, South Dakota, and Nebraska was colder and wetter than normal and had a tendency to retard ripening of crops but caused excellent water conditions. On the Belle Fourche project, South Dakota, less than 60 per cent of the project had been irrigated prior to the end of the month.*

*Rains on the upper reaches of the Pecos River provided an ample supply of water for the Carlsbad project, New Mexico, and left the reservoir holding 21,500 acre-feet of water. The lack of water in July on this project had very little effect on the crops.*

*West of the Rockies weather conditions were about normal for temperatures and slightly below normal for precipitation. Water supply conditions were good as a whole and were especially gratifying on the Okanogan project, Washington, where it now appears that there will be a holdover of around 1,500 acre-feet at the end of the irrigation season. The flow of Salmon Creek, which has maintained a better summer flow than any year since 1916, is largely responsible for this condition.*



Placing reinforcing steel ahead of concrete lining, Main Canal, Kittitas division, Yakima project, Washington

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; John H. Edwards, Assistant Secretary; E. O. Patterson, Solicitor for the Interior Department  
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner

P. W. Dent, Assistant Commissioner

George C. Krautzer, Director of Reclamation Economics

W. F. Kubach, Chief Accountant

C. A. Bissell, Chief of Engineering Division

Hugh A. Brown, Assistant Director of Reclamation Economics

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wildo Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	W. L. Vernon.....	B. E. Stoutemyer.....	El Paso, Tex.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	Montrose, Colo.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesmaa.....	C. E. Brodie.....	J. R. Alexander.....	Billings, Mont.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	.....	E. E. Roddis.....	.....
King Hill <sup>2</sup> .....	King Hill, Idaho.....	.....	.....	.....	.....	.....
Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	do.....
Minidoka <sup>3</sup> .....	Burley, Idaho.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Newlands <sup>4</sup> .....	Fallon, Nev.....	A. W. Walker.....	Erle W. Shepard.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte <sup>5</sup> .....	Mitchell, Nebr.....	H. C. Stetson.....	Virgil E. Hubbell.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Owyhee.....	Nyssa, Oreg.....	F. A. Banks.....	W. G. Evans.....	L. S. Kennicott.....	B. E. Stoutemyer.....	Portland, Oreg.
Rio Grande.....	El Paso, Tex.....	L. R. Fiock.....	R. B. Smith.....	R. B. Smith.....	H. J. S. Devries.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	.....	.....	Wm. J. Burke.....	Mitchell, Nebr.
Salt River <sup>6</sup> .....	Phoenix, Ariz.....	.....	.....	.....	.....	.....
Shoshone <sup>7</sup> .....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley <sup>8</sup> .....	Provo, Utah.....	.....	.....	.....	.....	.....
Sun River <sup>9</sup> .....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	do.....
Umatilla <sup>10</sup> .....	Hermiston, Oreg.....	.....	.....	.....	.....	.....
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Vale.....	Vale, Oreg.....	H. W. Bashore.....	C. M. Vosen.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	do.....	do.....
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	H. R. Pasewalk.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

Minidoka, American Falls Dam.....	American Falls, Idaho.....	.....	H. N. Bickel.....	O. L. Adamson.....	B. E. Stoutemyer.....	Portland, Oreg.
North Platte, Guarnsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>11</sup> .....	.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>12</sup> .....	E. R. Mills.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gibson Dam.....	Augusta, Mont.....	Ralph Lowry <sup>12</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Damsite, Elk Creek, Calif.....	H. J. Gault <sup>12</sup> .....	C. B. Funk.....	.....	R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.

<sup>2</sup> Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.

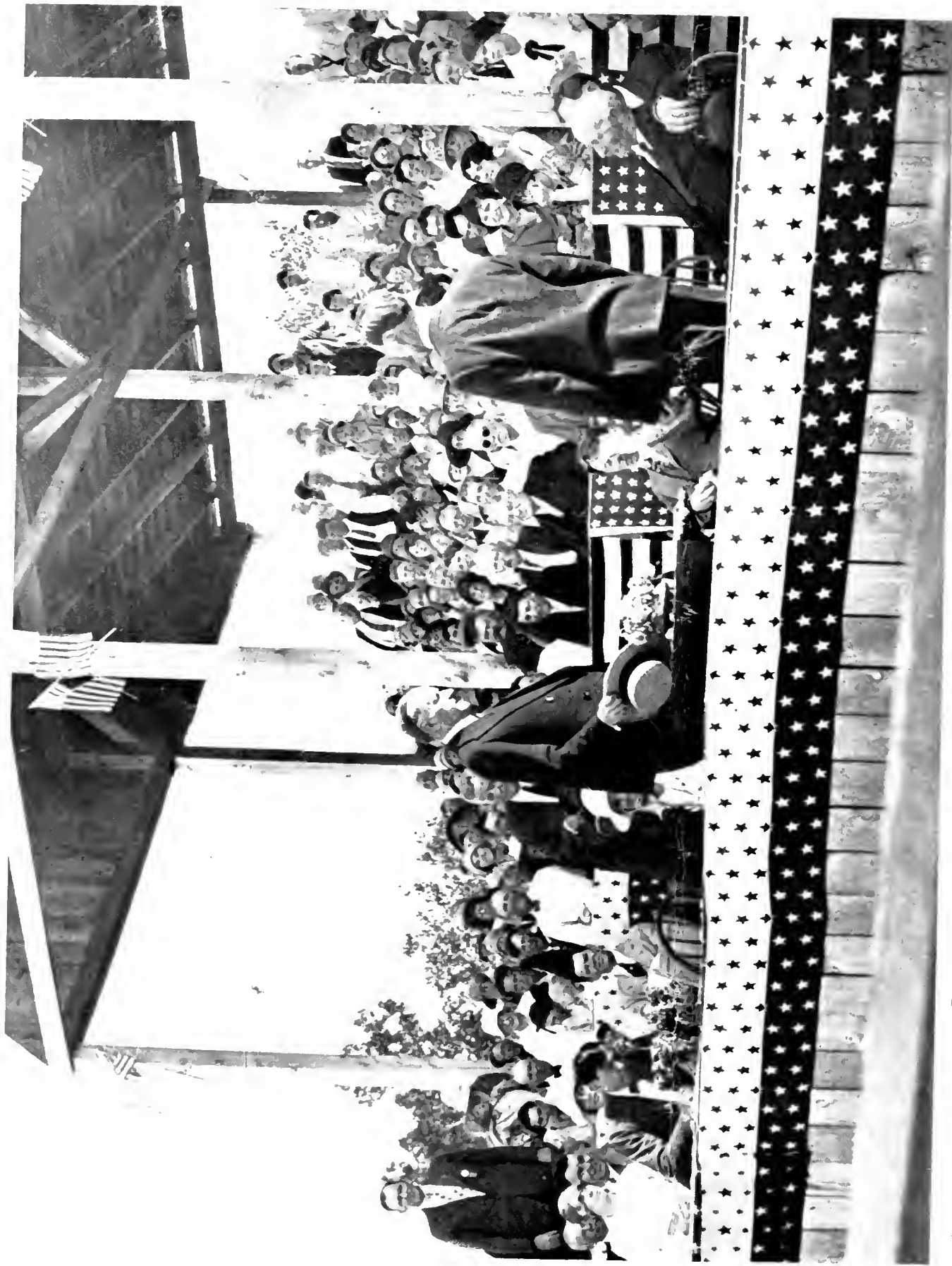
<sup>10</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.

<sup>11</sup> Resident engineer.

<sup>12</sup> Construction engineer.

## Important Investigations In Progress

Project	Office	In charge of—	Cooperative agency
Cache la Poudre investigations.....	Denver, Colo.....	Thomas Hawthorne.....	Poudre Valley Water Conservation Association.
Middle Rio Grande.....	Albuquerque, N. Mex.....	C. C. Elder.....	Middle Rio Grande conservancy district.
Salt Lake Basin, Rush Lake, and Moon Lake.....	Salt Lake City, Utah.....	E. O. Larson.....	State of Utah.
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	.....
Columbia Basin Project.....	Lind, Wash.....	B. E. Hayden.....	.....
Truckee and Carson River.....	Reno, Nev.....	A. N. Burch.....	.....
Heart Mountain investigations.....	Powell, Wyo.....	I. B. Hosig.....	.....
Southern investigations.....	Washington, D. C.....	C. A. Bissell.....	States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.



PRESIDENT COOLIDGE AT THE BUTTE COUNTY FAIR, NISLAND, BELLE FOURCHE PROJECT, SOUTH DAKOTA  
(SEE PAGE 148)



no. 11

# NEW RECLAMATION ERA

VOL. 18

NOVEMBER, 1927

NO. 11



THANKSGIVING

## *Principles Which Should be Included in Successful Land Settlement*



*SETTLERS must be selected. Developing farms under irrigation requires a certain amount of capital and certain definite qualities. Without these only disappointment can result.*

*They must be settled on the land, not in isolated units, but in groups or colonies of sufficient size to secure economic and social advantages.*

*There must be aid and direction in the preparation of the land for irrigation. In this, cooperation is important. Settlers working as a community can do many things better than as individuals working alone.*

*Many settlers who love farming and who, if given a chance, will become good farmers have inadequate capital. They should be helped to get a start by means of credit banks or other special arrangements.*

*Markets must be studied, crop rotations suggested, and a program of marketing worked out suited to the conditions which govern transportation from the producers to markets.*

*The payments of the initial years must be made as easy as possible.*

*The aim should be ownership of small farms rather than tenancy on larger estates.*

*ELWOOD MEAD  
Commissioner, Bureau of Reclamation*

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

NOVEMBER, 1927

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## *Interesting High Lights on the Reclamation Projects*

**F**OUR carloads of automobile trucks were delivered recently to agencies on the Shoshone project. As stated by the Powell Tribune, this is a good barometer of the increasing prosperity of the Powell Valley.

**T**HE principal work during September on the Stony Gorge Dam, Orland project, was the placing of concrete for the parts within the cofferdam to build all parts up above ordinary water level except the closure openings, so that the creek may be turned back through the closure openings before the time for winter floods in November.

**T**HE Potato Growers' Exchange and the Bean Growers' Association on the Grand Valley project are both active in taking care of the harvest of these crops. The shipment of beans is being made through the potato growers' stations and equipment.

**T**HE Malta Commercial Club, Milk River project, is taking renewed interest in the settlement of the project, and several members are spending considerable time in securing the return of forms circularized some time ago relative to the sale of lands and the construction of buildings on unoccupied farms.

**T**HE cotton crop on the Carlsbad project is being picked and ginned, with gins operating full time. The yield is very good and the crop is being sold as rapidly as picked at prices averaging about 23½ cents a pound.

**A** COMPILATION of the Yakima Valley Traffic and Credit Association shows that 5,183 cars of fruit and vegetables had been shipped from the valley to October 1, consisting principally of apples, mixed fruit, plums and prunes, apricots, pears, peaches, cherries, strawberries, grapes, melons, onions, and potatoes.

**F**AIRS were held recently by Morrill, Goshen, and Scotts Bluff Counties on the North Platte project. All report a record attendance and the best exhibits ever shown of both agricultural products and livestock.

**T**HE Colorado Potato Growers' Cooperative Association expects to handle the bulk of the potato crop on the Uncompahgre project and part of the onion crop, especially of those growers who also raise potatoes.

**A**N election by the settlers of the Black Canyon irrigation district, Boise project, to ratify the contract with the United States for the construction of the Payette division, was held on September 30 and carried with only one dissenting vote. The required recordable agreements with the individual landowners in the district are being secured.

**A** COMMISSION of livestock experts from Russia recently purchased 152 head of purebred Hampshire ewes from Minidoka project owners for breeding purposes. The price paid was \$40 and \$42 a head.

**T**HE airplane landing field at Burley, Minidoka project, has been selected as an official airport on the Salt Lake-Pasco mail route. Tentative arrangements have been made for the erection of beacon lights.

**C**ONSIDERABLE interest is being taken on the Yuma project in growing paper-shell pecans, and one syndicate has been formed locally with the intention of planting several large acreages. There are a few small acreages in the valley division which are producing very satisfactorily and additional small plantings have been put in during the past year. The water table and the climate are considered very favorable for this crop.

**T**HE Lynch-Cannon Engineering Co. completed on September 17, two weeks ahead of schedule, all work under its contract for the construction of the bridge over the American Falls Dam.

**T**HE main electric power lines being built by the Truckee-Carson irrigation district, Newlands project, to Stillwater and Harmon communities are nearing completion. Preliminary plans are under way to further extend the electric lines to Fernley, Wadsworth, Northan, Swingle Bench, and the island districts. Electrification of the project farms is one of the most progressive steps taken by the district in recent years and it will aid materially the intensive development of the farms.

**T**HE Farm Settlement Bureau, organized by the various irrigation districts on the Klamath project and the Klamath Falls Chamber of Commerce, reports that 10 private land holdings, comprising more than 1,200 acres in the Langell Valley and Horsefly irrigation districts, have been listed for sale. They also have prepared a list giving a brief description of each farm, which is being distributed to prospective settlers.

**T**HE new Black Hills sugar plant on the Belle Fourche project was steaming up the latter part of the month preparatory to opening and slicing beets the 1st of October. The new railway beet spurs and beet dumps have been completed and were receiving beets, with the exception of the last dump east of Vale, which was expected to be ready early in October. The new Vale elevator was ready for business and graveling on Highway 212 had progressed about 10 miles from Belle Fourche.

**A**BOUT 40,000 pounds of butterfat per month is being received at the plant of the Mini-Cassia Dairymen's Association, Minidoka project, in addition to the product marketed at local cream stations and cheese factories.

## *Economic Notes from the Reclamation Projects*

### *Regulations for Taking Crop and Livestock Census*

*On Federal reclamation projects for year ending December 31, 1927*

THE crop and livestock census for the year 1927 on Federal reclamation projects shall be taken by employees of the bureau under the direction and supervision of the project superintendent, except on projects which have been turned over to the water users, when the census shall be taken by employees of the water users' association or irrigation district under the supervision of an employee of the Bureau of Reclamation designated by the commissioner. If no such supervisor of the census is designated by the commissioner, then the manager or superintendent of the district or association shall act as supervisor of the census. The methods employed will be similar to those followed in 1926, except as hereinafter explained.

#### *CENSUS FORMS*

The record forms to be used by the enumerator will be the usual Bureau of Reclamation Form 7-332, as modified in 1925. The Washington office of the Bureau of Reclamation has a supply of these forms on hand, and the various projects should request the number required for this year. Surplus forms on hand from the 1925 or 1926 supply may be used this year, and this should be taken into account when requesting forms. The form enumerates most varieties of crops produced and stock kept on the various projects. Blanks are provided on the form for listing additional items. Automobiles, trucks, and tractors should be listed and valued separately from other farm equipment which should be valued as a lump sum.

#### *ACCURACY OF RECORDS*

The Bureau of Reclamation has found the crop and stock census data taken annually in past years to have great value for reference. Under section 4 of the act of December 5, 1924 (43 Stat. 672, 701), which provides for repayment of construction costs on the basis of the average gross annual acre income, these census data become of paramount importance and should be collected with great care. The enumerators should interview the farmer and secure his cooperation if possible. Absentee owners and other conditions will necessitate the use of good judgment based on the best information obtainable. Form 7-332 should be dated and signed by the owner where possible, otherwise by the enumerator.

#### *SUPERVISOR*

The project superintendent shall be the supervisor of the census on projects being operated by the United States. On projects being operated by the water users, an employee of the Bureau of Reclamation appointed for that purpose or the manager or superintendent of the water users' association or irrigation district shall be the supervisor of the census. The project superintendent, or employee of the Bureau of Reclamation designated as supervisor of the census, or the manager or superintendent of the water users' association or irrigation district, as the case may be, shall appoint the enumerators and review their work. He shall confer

with leading produce and commission men and water users of the project and determine the values to be applied to the various crops. He shall have prepared under his direction the necessary summaries of all data collected and transmit the original copy to the Washington office of the Bureau of Reclamation and a duplicate copy to the Denver office of the Bureau of Reclamation. Before the census shall be of any effect on those projects which have been turned over to the water users it is necessary that the Secretary of the Interior approve these summaries.

#### *INFORMATION SHOWN*

The crop census shall show, with respect to each farm, the total number of irrigable and irrigated acres, the number of acres of the various crops grown, the yields per acre, and the values of such crops. Supplemental data showing whether the crops were sold, fed, or stored should be shown.

#### *HOW TO VALUE*

Many farmers will not have sold their crops; then the enumerator shall place a value upon such crops in accordance with the unit prices as fixed in general by the supervisor; others will have fed hay and grain to livestock, and the value of such crops shall be determined as if the crops had been sold. Hay, fodder, or other harvested forage shall be valued in the stack on the farm. Crops such as grain, beans, potatoes, seeds, etc. shall be valued f. o. b. cars, shipping point, exclusive of the cost of containers. Fruits, berries, and vegetables shall be valued f. o. b. cars, shipping point or warehouse, exclusive of the cost of grading, packing, storing, and containers. All factory crops such as sugar beets, string beans, cucumbers, tomatoes, etc., shall be valued at the selling price to factories or dealers (including estimated bonuses) f. o. b. shipping point, when not delivered direct to the factory. Grain crops which were not harvested for hay or grain should be included as pasture. A distinction should be made in value between tame and wild irrigated pasture, and the value should be a reasonable annual rental for such pasture. Straw, sugar-beet tops, hay and grain stubble, etc., and other by-products should be listed and valued. All gardens and miscellaneous crops should be listed and valued.

### *Klamath County Fair Most Successful Held*

According to C. A. Henderson, county agent, the most successful fair Klamath County, Oreg., has ever held ended September 5. Nearly 7,000 people attended the fair. The new exhibit building, constructed at a cost of \$20,000, was completely filled with the finest exhibits and displays ever shown in Klamath County.

Mr. Henderson states that the exhibits of livestock were well balanced and showed considerable improvement over those of previous fairs. These included more than 50 head of beef cattle, 100 head of dairy cattle, and an increased number of sheep and hogs. Rabbits comprised more than 200 entries, compared with 75 in 1926, and showed much improvement in quality. Poultry was on a par with any previous year.

The outstanding features of the new exhibit building were the seven community booths, the quality of each being far superior to that of any previous year. All booths scoring above 79 were awarded the purple ribbon and a \$50 cash prize. Langell Valley, Merrill, Klamath Indian Reservation, and Central Community Club all qualified for this prize. Malin, Bonanza, and Wood River received honorable mention.

The boys' and girls' club work was amply represented in all classes, with demonstration teams performing in the cooking and homemaking clubs. Particularly in the dairy classes, many blue ribbons were won by club members.

## Dairy Cattle Credit Corporation On the North Platte Project

By George C. Kreutzer, Director of Reclamation Economics

ON the North Platte project, Nebraska-Wyoming, a credit corporation has been organized and incorporated for \$100,000, under the State laws of Nebraska, to finance the purchase of dairy cattle. Twenty-five thousand dollars was raised among the business men in Omaha, such as the Standard Oil Co., wholesale grocers, two of the largest banks, and other establishments which derived a large amount of their business from the North Platte Valley. Twenty-five thousand dollars was raised locally from business men and farmers. It is necessary for local capital to be in such a corporation to show their good faith and to insure the corporation being managed economically and along sound business lines. The Omaha business men promised to raise the additional \$50,000 when needed.

The purchase of capital stock creates the funds to be loaned to farmers on dairy cattle. A mortgage is taken over the cattle purchased, plus additional animals, so that the loan does not exceed 80 per cent of a fair value of the security. The notes and mortgages are then transmitted to the Intermediate Credit Bank at Omaha and rediscounted at  $4\frac{3}{4}$  per cent. The corporation, however, guarantees the payment of these loans. The spread between the  $4\frac{3}{4}$  per cent charged by the Intermediate Credit Bank and 7 per cent charged the borrowers provides a fund for administration, appraisal, and for the creation of a reserve fund. The intermediate credit act provides that interest rates can not exceed the rediscount rate by more than  $2\frac{1}{2}$  per cent.

When I visited the North Platte project on my recent trip the association had already loaned \$35,000 and had brought in 18 carloads of cattle. The purchase of these cattle is arranged for by the association and a small handling charge of about \$5 a head added to take care of these services. Most of the cattle were purchased in Wisconsin and consisted of young heifers around 2 years of age. There is not the chance of loss in buying young stock as there is on mature cows. The young stock have everything in front of them. The purchase price of these heifers, which in most cases would be ready to freshen in two or three months, varied from \$100 to \$135 and were from high-grade herds, having cow-testing records. Only one carload was purebred, and these, I understand, cost from \$150

to \$160 per head. Generally, the association does not favor the buying of purebred cattle, and this bears out my experience, unless they can be bought as calves or yearlings and at a low price.

The association collects its money in 36 equal monthly amortized payments and through orders on cheese factory or butter plant. It is believed that one good man could make the loans and inspect herds frequently regarding feeding and care of cattle for about a million dollars worth of credit. If feeder loans are included in the set-up, he could, of course, look after more business.

## Dairy Cattle Arrive on North Platte Project to Augment Valley Herds

A RECENT issue of the Scottsbluff Star Herald states that two more cars of dairy cattle for farmers of the North Platte Valley arrived in September, bringing the total shipments to 14 cars. Of these, one car were pure-bred Guernseys and the balance were pure-bred Holsteins.

The two cars were brought in by John Wilson who, with Eben D. Warner and Phil Rice, has been in the dairy States to the East making selections for the farmers who are bringing in good foundation stock with which to build up the herds in the valley and make this section one of the coming dairy sections of the country.

Four cars were brought in recently by Phil Rice and have been already placed on the farms over the valley. In this shipment was one car load of heifers with the balance mostly coming three's. In the two cars are included 15 pure-bred young bulls, all 1 and 2 year olds, most of them ready for light service. These bulls and many of the cows and heifers are from the Sir Pietertje Ormsby Mercedes 37th and the Spring Brook Bess Burke 2d strains.

Both these strains are already well known and established in the valley where their records are holding up to what might be expected from descendants of these illustrious lines. One of the features of the method of buying which is used by the finance corporation is the fact that most of the recent shipments are being brought in with an average cost to the farmer of around \$115 to \$120.

The intermediate credit act permits such a corporation to rediscount its paper through the bank to the extent of ten times its paid-up capital and surplus. Thus a \$10,000 corporation should secure \$100,000 in credit. The one at North Platte contemplates the use ultimately of \$1,000,000 in credit because it is incorporated for \$100,000.

The difficulty with such institutions is to nurse them along until sufficient business is secured to pay the overhead expenses. At North Platte their corporation is being nursed by the president of the North Platte Valley Telephone Co., whose sole interest in the matter is to make farmers prosperous and thereby create a demand for telephones. In the meantime, he is charging them nothing for bookkeeping or for his time, which is valuable because of his wide business experience.

Some of the cows are higher, as the individual wishes of the buyers are considered and some of them prefer older stock with records already established. None of them, however, are bringing such prices as to make them prohibitive to the local men.

Mr. Warner, who is looking after the affairs of the finance corporation which is backing the dairy movements, states that he expects the total shipments to reach 40 cars in the near future. He already has over 150 applications for stock that have been approved by the finance corporation and there are many other applications which have not yet been passed on by the board.

Mr. Warner just returned from a trip which took him through 10 States, including the dairy sections, and states that he is exceptionally well pleased with the prospects for the valley. He has great faith in the future development of dairying in this section, with the ultimate result of more prosperity for the farmers and the entire valley.

The basis of pure breeding in the United States, except in the case of poultry and pet stock, is pedigree registration. That is, animals to be classed as purebred must be registered in a book of record established for the breed.

Prepotency is the power of an animal, male or female, to stamp its characteristics on its offspring.



## Riverton Project Gate Keeper Takes 11 First Prizes for Crops

*By H. D. Comstock, Superintendent Riverton Project, Wyoming*

**W** T. PEYTON, gate keeper at the Wind River Diversion Dam, Riverton project, Wyoming, broke up a garden of 4 acres at the highest point on the Riverton project at an altitude of 5,550 feet above sea level in the spring of 1926. His success in his garden operations that year is told on page 200 of the *NEW RECLAMATION ERA* of November, 1926.

In 1927, in spite of the fact that his duties as gate keeper took more time and his garden was somewhat injured by hail about July 28, and that the exhibits at the Fremont County Fair were greater in number and better in quality, making competition more keen, he was even more successful. His exhibits took 11 first

prizes as follows: Irish Cobbler potatoes, table stock; red McClure potatoes, table stock; Irish Cobbler potatoes, seed stock; red McClure potatoes, seed stock; cucumbers for table use; cucumbers for pickling; parsnips; leaf lettuce; table carrots; spinach; oyster plant. Seven second premiums as follows: Individual farm booth; display three varieties of potatoes; Swiss chard; kohlrabi; celery; rhubarb; table peas. Five third premiums as follows: Bliss Triumph potatoes, table stock; beets for table use; summer squash; cauliflower; crooked-neck squash.

In addition Mrs. Peyton took first premium for canned cauliflower and hubard, second premium for canned

beets, carrots, cherries, and plums, and third premium for canned peas.

This year the fair association sent a few of the best exhibits to the State fair at Douglas. At this fair Mr. Peyton's red McClure potatoes took first premium and his oyster plant took second premium.

The people at and near Pavillion arranged a booth at the county fair with no attempt to secure individual premiums but rather to show doubters what the project lands could do. This booth made a very creditable appearance, especially in the line of vegetables and flowers and aroused much favorable comment. Mrs. Geo. W. Crowder took first premium on grape jelly, Mrs. Powers second premium on a braided rug, Mrs. A. G. Keys second premium on a hooked rug, and H. V. Ferriss second premium for photographs of county scenes.

John Hays, whose ranch is located on Dry Creek about 2 miles above the main canal, took several premiums for dairy produce.

## Railroad Development in the Snake River Valley

*By R. J. Newell, Superintendent, Boise Project, and Joel Priest, of the Oregon Short Line Railway Company*

**R**ECLAMATION of the desert lands of the Snake River Valley was begun 60 years ago, and its development has been both extensive and rapid until the great crescent of the Snake, in southern Idaho, has become one of the world's greatest and most productive irrigated areas.

The United States Government has contributed largely to this development by the construction of the Boise and

Minidoka reclamation projects and the American Falls reservoir, which latter has reinforced practically every water right in the upper valley.

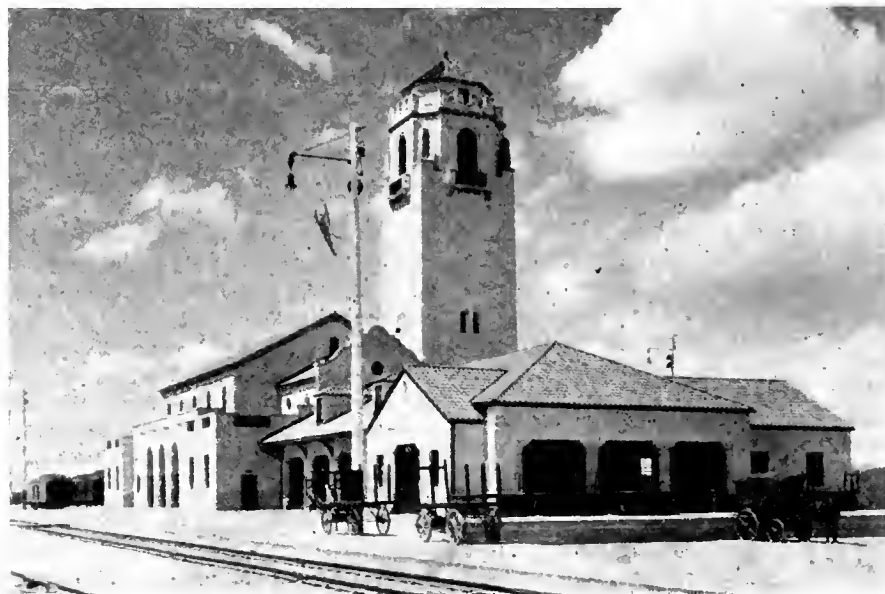
The valley is served by one railroad system, the Oregon Short Line. Rapid expansion and improvement of this system have been necessary to furnish the increased facilities required to take care of the products of irrigated acreage.

The chief engineer has furnished a statement listing the capital expenditures on extensions, line changes, and double track-ing since 1922, which totals \$7,860,000.

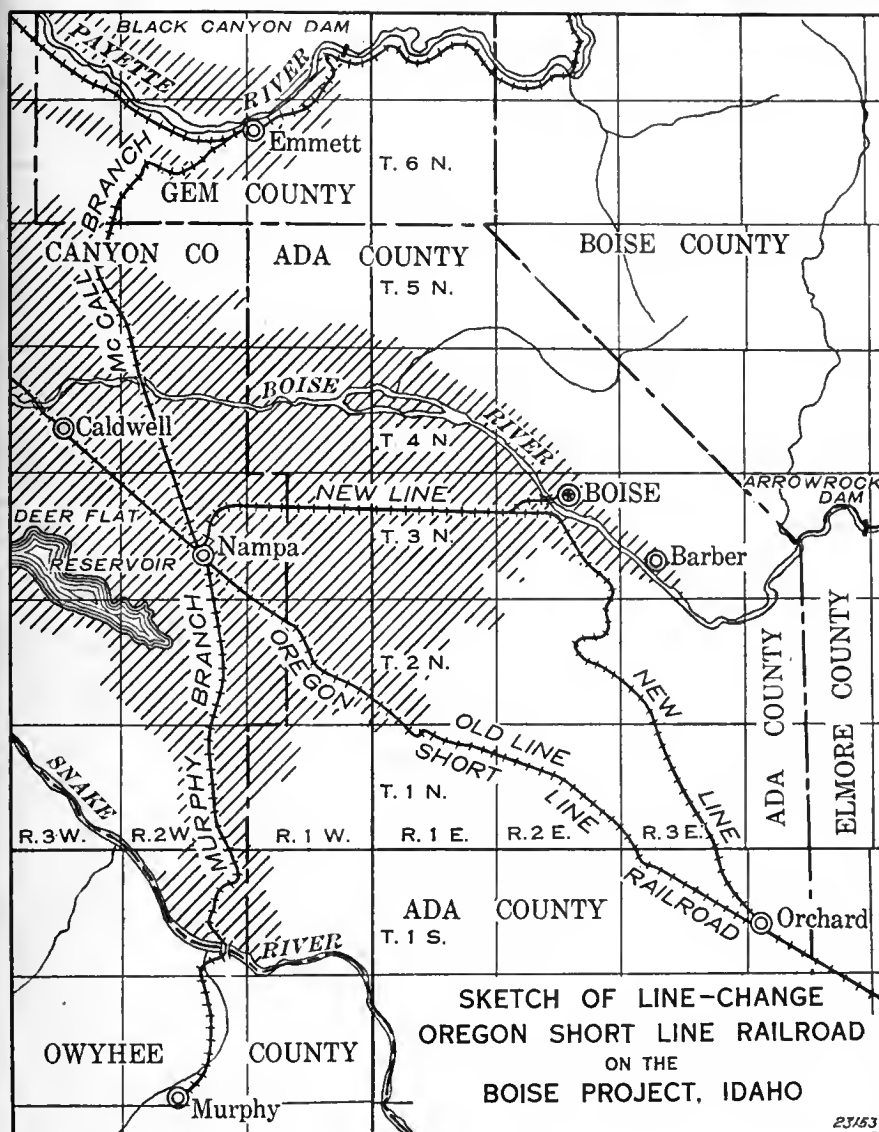
The most important feature of this improvement program has been the relocation of the main line between Nampa and Orchard to pass through Boise. This line revision, which is indicated on the accompanying sketch, included the construction of 29.8 miles of additional main track at a cost of \$3,014,800.

Passenger, mail, and express service for Boise has been greatly improved thereby, a saving of two hours time in traffic to and from the East and 40 minutes on western traffic being accomplished. In addition to the saving in time, fares to and from points east have been reduced about \$1 each. As Boise's eastern passenger traffic amounts to not less than 2,500 fares per month, the change has resulted in a direct saving to the public of \$2,500 per month in cash and 2,500 persons per month have each been saved two hours' time and the inconvenience of the change at Nampa that was originally necessary.

This costly improvement was deemed justified in view of the steady growth of the city of Boise, based on the solid development of irrigation farming in the Boise valley and in general over the State of Idaho, of which Boise is the capital city.



New Oregon Short Line railway station, Boise, Idaho



## Belle Fourche Project Asks Credit Legislation

The following resolution has been adopted by the board of directors of the Belle Fourche irrigation district, Belle Fourche project, South Dakota:

Whereas resettlement of the unoccupied farms in the project is the major development activity, more farmers being necessary to produce the specialized crops suitable in the project; and

Whereas such resettlement is largely dependent upon getting more and better buildings erected on many project farms; and

Whereas about 400 farms in said project need building improvements before suitable occupants can be secured; and

Whereas land credits with ordinary agencies have been and still are so restricted as to be inadequate under the given conditions and practically no money available for building loans; and

Whereas the development of the project from the standpoint of the settlers, the

United States, and the industrial concerns here represented, calls for more ample land credits: Therefore, be it

*Resolved*, That we request our delegation in Congress to secure legislation providing for a system of land credits within the Federal Bureau of Reclamation enabling owners of irrigated lands to borrow money on first-mortgage loans for the purpose of constructing buildings and other real-estate improvements upon their lands.

Dated at Newell, S. Dak., this 9th day of September, 1927.

BOARD OF DIRECTORS,  
Belle Fourche Irrigation District, S. Dak.

CHARLES M. REID, *President*.

C. E. LIVINGSTON.

G. W. MORSMAN.

SYLVESTER ALLISON.

W. C. STAIGER.

HANS SORENSEN.

W. D. BUCHHOLZ, *Secretary*.

## Miniature Farm Shown At County Fair

The Richland County Fair was held recently at Sidney, Mont., on the Lower Yellowstone project. Exhibits of agricultural products were excellent and the fair was a success from every standpoint. A miniature irrigated farm, 6 by 12 feet in size and representing 80 acres, was prepared by the project employees. The farm showed various systems of irrigation and a complete crop rotation. Seed was planted in the plots so that the crops were actually growing and water was constantly running in the ditches. The exhibit attracted much attention, particularly from visitors not familiar with irrigation.

This is the time of the year when many stock owners go to fairs or livestock shows. There one can get much good information by looking at the stock and talking with the exhibitors.



Oregon Short Line railway station, Nampa, Idaho



## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



### The Calory: Its Meaning and the Part It Plays in Everyday Life

THE word "calory" is derived from "calor," a Latin word meaning heat. It is a unit for measuring quantities of heat, just as an inch is a unit for measuring length or a pint is a standard for measuring liquids. Government specialists contend one calory equals the amount of heat required to raise the temperature of a gram of water 4 degrees.

#### SOME FACTS ABOUT FOOD

If some person claiming superior knowledge stated that he had the secret of long life everyone would immediately be interested or, to say the least, curious, and yet the advice of physicians goes unheeded by many year after year when they say the best way to prolong and enjoy life is to do everything moderately, and this is particularly true of eating. Research brings to us the means of planning our meals so that they may be well balanced and furnish the required fuel for strength and energy. Foods are divided into three classes:

Protein, which supplies the material to make the framework of the body, the muscles, skin, cells, and fiber, and will be found

in such foods as spinach, white of egg, whole milk, butter, cream, and cod and other fish liver oils.

Carbohydrates furnish energy and are contained in pastry and candy, nuts, white bread, and ice cream.

Fats furnish heat, contained in abundance in cream cheese, pork, goose, and egg yolks.

The first named is more easily stored up by the adult than the latter two, which expend themselves more readily as we go about our daily tasks, recreation, and exercise, or, in other words, burn themselves out, just as fuel burns in the heater.

Fruits and vegetables have medicinal values.

It is not generally known that onions and celery are good for nervous people, and that either cooked or raw, if eaten persistently and in large quantities, they will aid in overcoming insomnia.

A sirup made of onions and sugar is a "tried and true" remedy for colds and hoarseness.

Spinach, asparagus, and dandelions are rich in iron and should be eaten by persons who are anæmic.

Tomatoes act on the liver.

Raw carrots or beets are excellent for the blood.

Adults are inclined to eat too much for their own good. Whether you are eating over or under your requirements can best be gauged by weighing often—this will eliminate guesswork as to how much food you require, as your weight will register the result.

#### Kitchen Convenience

This well-arranged farm kitchen is in Essex County, N. J. The modern sink, with its double drain boards, is placed sufficiently high for a medium tall woman. It has splendid light from the double window above and also from the window in the dining alcove, which is near enough to make meal getting a very simple problem, yet just enough removed from the activities of the kitchen to be pleasant.

The useful tea wagon was made by the home-maker and her husband out of the backs of two folding chairs that were no longer fit for service.

The stool on which one can sit while washing dishes is also homemade. The wooden rack saves the bottom of the sink from marks made by the dishpan. Other features that make this kitchen attractive to work in are the cretonne curtains over the sink, and the applied drapes in the alcove.

#### Appreciation

"Have I not eured ten and where are the other nine?"

Mrs. Hayward's friendly and appreciative note of the part the Bureau of Reclamation is taking in making solvent enterprises of all our projects deserves special mention. So often we are either too busy or unmindful of what a little statement of appreciation means to those who are laboring for a big cause.

As these articles by project women appear, I trust it will act as an incentive for further expressions from project women. Just as you enjoy reading these, so will others enjoy anything you might write. Let us now start a little teamwork in putting over a bigger and better section of interest to women in our NEW RECLAMATION ERA.



Convenient kitchen with tea wagon made by housewife from two folding chairs

In the September issue of the ERA appears an article entitled "Cooperation" and into the mind of the writer came the lines written by Kipling on the subject.

It is quite a coincidence that these same lines should come into the mind of one of our project women on the Minidoka

project, and also that this same subject should suggest itself to her in writing for the ERA. The thought is so nicely carried out that I am presenting the article as she wrote it, as I feel sure any thought along this line is never voiced too often.

## Cooperation

*By Mrs. Williard Hayward, Rupert, Idaho (Minidoka Project)*

It is particularly pleasing and encouraging to Idahoans at this time to note the harmony and cooperation between agriculture and industry in this State. These two mighty factors of our Commonwealth, the real basic elements in all that the State is or may become, have had at times their little misunderstandings and antagonisms. Fortunately such a situation no longer exists; the two have joined hands for progress, prosperity, and happiness of the State as a whole. May this unity and cooperation be everlasting.

On our Minidoka project we find the same splendid cooperation, with all farmers and business people working for the upbuilding of the community. Many of our business people were once homesteaders, developing their farms from the sage, and some at the present time own farms as an investment, thus giving them an insight into the problems of the farmers. We find our farmers a splendid class of people, home loving and with a desire to make this country such that their children will be content to make it their home.

The people are appreciative of the cooperation of the Bureau of Reclamation that made this project possible. The assessed valuation of real estate and other property on the gravity division has been increased from the original investment of \$2,854,868.30 to \$13,290,000, the major portion of which is the result of the Government's investment of \$2,810,000 in the irrigation works to serve the lands in the division.

The gross value of crops grown on all projects during the last 10 years on land irrigated from works constructed by the Government amounts to more than \$1,000,000,000, or an average of \$53 per acre each year, about twice the per-acre returns from the United States as a whole.

Crop returns from the gravity unit, Minidoka project, for the seven years ending 1926 show a total of \$12,936,617. The crops for the year 1925 alone amounted to \$2,539,667, while the total construction charge for the gravity unit as of January 1, 1927, was \$2,854,868.

The Community Club and the Grange, composed of both business people and

tillers of the soil, are found sitting in common council discussing their mutual problems. They believe that in council there is wisdom, and it is wisdom that will make for the progress of any people and for the development of any project.

With this understanding there comes the desire for harmonious relations. Warfare is destructive. It destroys energy and wealth; cooperation is constructive. It harbors and increases wealth, it builds, it leaves a lasting monument—it is the real genius of good American citizenship.

One outstanding example of teamwork has been demonstrated in Minidoka County the last two years in maintaining the county fair. Although sponsored by the Pomona Grange, a goodly portion of the financial help came from the business people. All worked shoulder to shoulder and staged a fair that any county could well be proud of.

An exhibit was sent to Boise, a distance of 200 miles, to be entered in the State fair. It attracted a great deal of attention and received first prize for display

and second place on points. This did much to advertise our county.

But through all activities, whether play or work, you will note "The Everlastin' Teamwork."

## Salt River Power Helps Pay for Project

The Associated Arizona Producer prints the following in a recent issue:

"The entire output of the Salt River project power system for the months of May, June, and July was 80,000,000 kwh, of which the largest was July, 30,000,000 kwh.

"Perhaps this would be more intelligible to the water users who benefit from this income to express it in terms of dollars and cents. The money value of this power was \$600,000, actually billed out or used on the project. For the 10 months beginning October, 1926, and ending July 31, 1927, the gross power revenue was \$1,150,000. The very large proportion of this earned in the last 3 months of the 10 is due principally to the influence of the Horse Mesa plant. The above are round numbers, of course.

"August and September output should place the year's earnings at more than \$1,500,000. It is indeed gratifying to the great bulk of the shareholders of the water users' association and to its officials, whose faith has brought this great world-famous development to completion, to be able to exhibit figures like these to the few who doubted."





## Dedication of American Falls Dam, Idaho

By E. B. Darlington, Superintendent, Minidoka Project, Idaho

COMPLETION of the American Falls Dam, on the Snake River, Idaho, forms the second largest storage reservoir for irrigation in the United States and marks an epoch in the agricultural and industrial life of southern Idaho. By impounding flood waters which heretofore have run inutility to the sea, this structure now affords security of water supply for the irrigation of a large part of Snake River Valley. The capacity of the great basin which has been closed by an artificial barrier is 1,700,000 acre-feet, enough water to cover the entire State of Rhode Island more than 2 feet deep.

Desiring to commemorate the completion of construction and to emphasize the significance of the reservoir as an asset in the social and economic development of this region, the residents of American Falls and neighboring communities arranged a formal dedication program, and on September 28 the town was thronged with people to witness and participate in the ceremonies. During the day the dam was thrown open to inspection by the public, and many visitors drove over the new roadway traversing the top of the structure, walked through the interior galleries, and examined the mechanism for regulating outflow.

The dedication exercises consisted in general of an outdoor pageant and a program of addresses and music carried out in one of the local theaters on account of disagreeable weather conditions. Among those who participated in the

various functions of the day were some of the most distinguished citizens of Idaho, including a number of the men who, by their foresight, zeal, and energy, have helped to make possible the accomplishment of this great undertaking.

The first address was made by Construction Engineer F. A. Banks, who has been closely connected with the work since its inception and whose ability and ardor during both the promotion and the construction stages have in large measure brought the project to successful fruition. Mr. Banks sketched the history of the development and described some of its unique phases, among which were removal from the submerged area to higher ground of almost the entire town of American Falls; the organization of a giant irrigation district embracing lands in several counties; the financing of a large part of the costs by cooperation with the Government of some 23 companies, districts, and individuals; the purchase of water rights and other property from the Idaho Power Co.; and the acquisition of some 30,000 acres of land from the Indians. Mr. A. E. Paddock, superintendent for the contractors, the Utah Construction Co., was introduced by Mr. Banks as his fellow-worker, and his work pronounced good.

Gov. H. C. Baldridge stressed the value of the reservoir as an asset to Idaho and emphasized the importance of providing foodstuffs for the future population of the Northwest, which he asserted was increasing with pronounced rapidity.

Congressman Addison T. Smith, chairman of the Committee on Irrigation and Reclamation of the House of Representatives, told of some of the obstacles encountered and difficulties overcome in securing congressional support of the project, but he felt that anyone who had been connected with the undertaking and who had helped to make it possible could now point with pride to the completed enterprise.

The scriptural pronouncement, "Without vision, the people perish," was the keynote of an address by R. E. Shepherd, president of American Falls Reservoir District No. 1 and of the American Falls Advisory Board. One of the visions which had been beheld by far-seeing men in Idaho had materialized, other opportunities for development could be discerned, and further progress would come as the result of the zeal of people who first saw visions.

Former Gov. C. C. Moore, during whose administration a large part of the promotion and construction work was done, paid a high tribute to the pioneers who conceived the project and to Government officials and others who had pushed the work to completion.

A notable feature of the program was an address by Chief Jack Edmo, of the Shoshone Tribe of Indians, delivered in his native tongue and in full tribal regalia. The address was interpreted by State Senator Maurice M. Myers, master of ceremonies of the day. Many of the Indians from the Fort Hall Reservation



American Falls Dam



were present to hear their chief speak to the white men. Chief Edmo said the river-bottom lands had long been the pasture ground for their ponies and a favorite site for camps, but if the great lake which now covered many acres was for the benefit of the country, the Indians were willing to make the sacrifice.

Outdoor phases of the celebration included a street parade, made colorful and picturesque by a file of Indians in elaborate headdresses and tribal costumes; a cavalcade of cowboys and rough riders; and a procession of school children carrying flags and pennants. Music was furnished throughout the day by the Municipal Band of Pocatello, the Rockland High School Band, and the Blackfoot High School Band.

The dam is of the concrete gravity type, flanked by earth embankments on each end. It has a total length of 5,227 feet and a maximum height of 83 feet. The spillway section is equipped with 15 radial gates operated by motor-driven hoists located in an upper gallery. There are 20 hydraulically operated high-pressure gates controlling outlets through the dam at the base. The operating mechanism for these gates is in a lower gallery. Six penstocks 15 feet in diameter have been provided to facilitate power development. Two of these, located on the east side of the spillway, are for use by the Idaho Power Co. The remaining four penstocks were built as a part of the proposed Government power plant.

The reservoir at maximum stage submerges 61,000 acres, about 30,000 acres of which were Indian lands. The storage basin is about 25 miles long and has an average width of  $3\frac{1}{2}$  miles. During the past summer it was filled to a capacity of a little over 1,700,000 acre-feet. There will be a holdover of nearly 1,400,000 acre-feet at the end of the season.

### *Advertising Signs for American Falls Dam*

Two large signs of the character shown in the accompanying illustration have been erected along the old Oregon Trail in the vicinity of American Falls, Idaho, to advertise the completion of American Falls Dam and the agricultural possibilities of this region. The sign boards are 12 by 50 feet in size. The cost was borne jointly by Power County and the city of American Falls. The signs are in conspicuous locations, on a highway carrying heavy traffic, and undoubtedly direct the attention of many people to this locality.



One of two signs advertising the American Falls development

## *Colonization in the Argentine*

A RECENT issue of the Bulletin of the Pan American Union states that the Argentine railway companies have agreed to form a joint organization for colonizing the lands served by their systems for the benefit of agriculture in particular and the country in general. The object is to bring families direct from abroad for the purpose of land settlement. Families already in the country who may wish to avail themselves of the scheme will be offered similar facilities to those accorded new arrivals.

Each company is to retain superintendence of colonies within its own particular sphere, providing the necessary funds, determining the area to be cultivated, and selecting and purchasing the lands to be colonized. The companies agree not to seek any profit in the resale of the lands to the colonists, that point being an essential condition of the organization. When colonists are charged for land, the price is not to exceed its cost price plus the value of the buildings, installation, etc., plus 10 per cent of the total sum, the latter to serve as a reserve fund for incidental expenses. Long terms of payment will be accorded to settlers for purchases of land and installations. When the purchaser has paid 20 per cent of the total price of the land he will be given a title deed, the remainder to bear interest at the rate of 7 per cent and 1 per cent cumulative amortization annually.

Arrangements have been made to advance funds to families abroad who may

not have sufficient funds for the purpose of defraying the first year's working expenses after arrival, the consortium to advance a sum sufficient for the purchase of indispensable working adjuncts, such as animals, poultry, etc. The amount so advanced is to be repaid by the settler from the proceeds of the first sales made by him and prior to his making the first payment on his land.

Cooperative societies will be organized in each colony for the sale of provision, etc. A consignment section will also be opened by the consortium, to be used as a central point where the colonists will be able to sell their produce, and reasonable sums will be advanced to the colonists on their crops in storage, the consortium also being empowered to insure the crops and the homesteads. When the colonies attain sufficient numerical importance, the consortium will organize in each an urban center comprising a church, school, police station, premises for the cooperative society, blacksmith and carpentry, etc.

The capital of the consortium will be fixed by the companies in proportionate ratio and will be made up of a first quota of 25 per cent, payable when the contract is signed, and with payment of the remaining quotas of 25 per cent each when such is deemed necessary, and within 90 days of the directors' meeting at which the recommendation is made. The companies will contribute to the capital in proportion to the mileage of their lines.

# Design, Construction, and Detail Cost of McKay Dam Umatilla Project, Oregon

By Byram W. Steele, Engineer, Denver Office

**M**CKAY DAM, which is located on McKay Creek 5 miles above its confluence with the Umatilla River and 7 miles south of the town of Pendleton, Oreg., has recently been completed. The dam and all appurtenant works were constructed entirely by Government forces. The storage capacity of the reservoir created by this dam is 73,000 acre-feet of water, which will be used to supplement the natural flow of the Umatilla River for the irrigation of approximately 35,000 acres, now partially developed, in the Stanfield and Westland irrigation districts and in addition will furnish water for other lands being investigated. The reservoir is a mile wide and 4 miles long and receives its storage water from both McKay and Birch Creeks, the flood waters from Birch Creek being diverted to the McKay Creek watershed through a feeder canal. The completed Umatilla project will comprise the original project of 17,000 acres, the west extension of 11,000

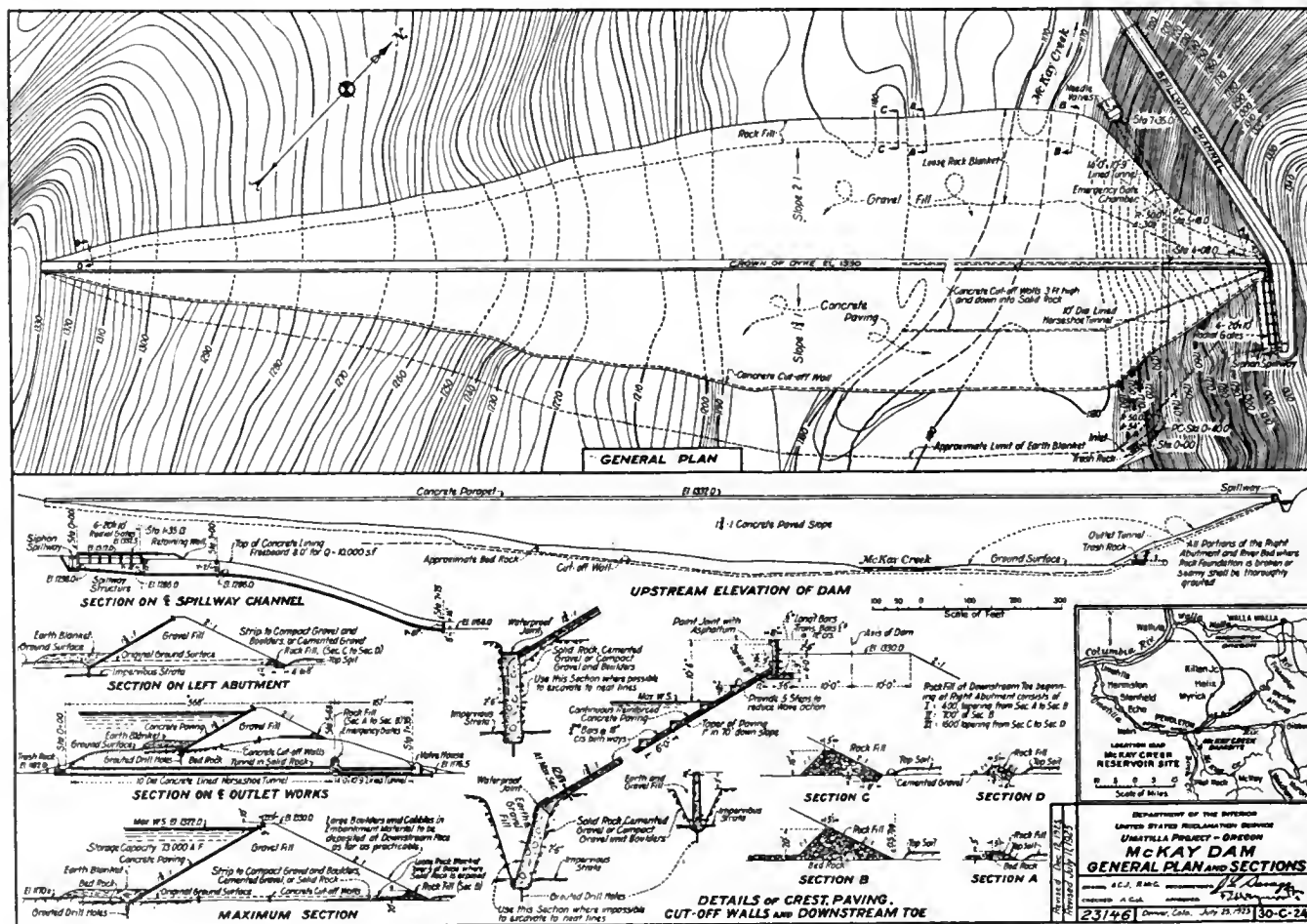
acres, and the 35,000 acres mentioned above, making a total of approximately 65,000 acres.

## THE DAM

The dam is a gravel embankment of 2,287,010 cubic yards having a crest length of 2,700 feet and a maximum height of 165 feet. The downstream slope is 2 to 1 and the upstream slope  $1\frac{3}{4}$  to 1. Before starting the embankment it was necessary to strip the left abutment and the creek bottom of all top soil down to the compact gravel or solid rock. The quantity of stripping was 160,000 cubic yards and was started in July, 1923. The stripping was done with frescos where the haul was less than 300 feet and the remaining area was handled by loading into dump wagons with an Austin dragline equipped with a one-half yard bucket and hauling with teams. The earth blanket shown in the maximum section is composed of the top soil stripped from

the foundation, which was deposited along the upstream toe of the dam and later spread as indicated on the drawing.

The material in the embankment consists of a well-graded gravel with a variable content of sand and earth as a binder. This material was obtained from the creek bottom above the dam with an average haul of about  $1\frac{1}{2}$  miles. The borrow pits were irrigated sufficiently to give the embankment material the right amount of moisture to insure the maximum degree of consolidation when rolled. All material was excavated with two 80-B electrically operated Bucyrus shovels, loaded into 4-yard dump cars remodeled to hold 6 yards and hauled to the dam an average distance of  $1\frac{1}{2}$  miles with 18 and 20 ton oil-burning dinky locomotives. After the gravel was dumped from the cars, it was spread in layers not to exceed 8 inches in thickness with horse-drawn grading machines and compacted by rolling with traction engines. Each 8-inch



layer of the fill received four trips of the roller, except a strip about 15 feet wide along the upstream slope of the embankment which received six passes of the roller. The embankment was built to an upstream slope 2 feet outside the theoretical slope and the excess material excavated and placed in the embankment.

The gravel fill was started in February, 1924, and was finished in December, 1925, continuous operation being maintained except for about one month during the winter of 1924-25. The total embankment contains 2,287,010 cubic yards and was placed at the average rate of 110,000 yards per month. The maximum daily run was 8,000 yards in two shifts and the maximum yardage placed in any one month was 165,000, which was placed April, 1925.

The equipment used in building the gravel embankment consisted of two 80-B electrically operated Bucyrus shovels used in the gravel pit, 5 traction engines and 3 grading machines used on the fill, 11 oil-burning dinky locomotives and 120 six-yard dump cars used in hauling the material  $1\frac{1}{2}$  miles from the borrow pit to the dam.

The upstream face of the dam, the slope of which is  $1\frac{1}{4}$  to 1, is protected by a continuous reinforced concrete slab varying in thickness from a minimum of 8 inches at the top to a maximum of  $12\frac{1}{2}$  inches at the bottom of the highest section, the rate of increase of thickness in the concrete face being 1 inch in 70 feet down the slope. The reinforcing consists of  $\frac{3}{4}$ -inch round bars placed at 18-inch centers both ways and approximately in the center of the slab. The concrete was poured in alternate strips 12 feet wide placed up and down the slope at right angles to the longitudinal axis of the dam.

This reinforced concrete face slab connects at the crest of the dam with a cantilever type parapet wall 6 feet 6 inches high, being 2 feet 6 inches above the crest. At the intersection of the  $1\frac{1}{4}$  to 1 slope with the cemented gravel or rock surface the face slab terminates in a cut-off trench to solid rock. In this cut-off trench in the lava rock foundation grout holes were drilled with a model 21 turbodrill mounted on a derrick at from 3 to 10 feet centers and varying in depth up to a maximum of 45 feet. After this cut-off trench was filled with concrete, cement grout was forced into the holes under air pressure of approximately 100 pounds per square inch. The yardage of concrete in the cut-off trench is 1,656, in the concrete face 17,251, and the linear feet of grout holes drilled in the bottom of the cut-off trench 11,201.

### Detail cost of McKay Dam

Item	Quantity	Unit cost	Total cost
Examination and surveys.....			\$17,248.02
Clearing and care and diversion of river.....			9,966.20
Excavation:			
Class I, dam.....cubic yards.....	2,266	\$0.35	790.18
Class I, stripping for embankment.....	160,155	.36	57,669.77
Class I, dam.....do.....	2,955	.62	1,867.85
Do.....do.....	1,758	.93	1,634.15
Class II, dam.....do.....	1,098	2.41	2,650.89
Class III, dam.....do.....	2,099	8.26	17,346.80
Class I, spillway.....do.....	1,601	1.05	1,687.72
Class II, spillway.....do.....	341	.67	227.79
Class III, spillway.....do.....	2,553	2.09	5,344.46
Class III, spillway channel.....do.....	32,234	2.24	72,332.90
Class I, outlet.....do.....	266	1.40	372.35
Class II.....do.....			346.88
Class III, open cut.....cubic yards.....	1,411	3.31	4,682.30
Class III.....do.....	360	3.97	1,430.59
Class III, tunnel.....do.....	4,186	6.42	26,886.05
Embankment.....do.....	2,287,010	.44	1,008,544.03
Structure drainage (dam).....do.....			71.17
Do.....cubic yards.....	5,635	1.94	10,958.19
Do.....do.....	45,563	.417	19,032.54
Structure drainage (spillway).....do.....			2,052.55
Grouting (outlet works).....do.....			2,698.07
Grouting (upstream cut-off in dam).....linear feet.....	11,201	1.43	16,034.92
Concrete:			
Dam, reinforced in cut-off trench.....cubic yards.....	1,656.5	12.55	20,787.78
Dam, paving.....do.....	17,251.4	14.90	256,735.04
Dam, reinforced.....do.....	875.4	18.15	15,889.79
Do.....do.....	594.8	19.54	10,744.54
Spillway, reinforced.....do.....	385	12.50	4,893.89
Do.....do.....	1,902.5	16.45	31,301.07
Do.....do.....	580.4	21.38	14,154.62
Outlet, reinforced.....do.....	165	17.57	2,899.87
Outlet, tunnel lining.....do.....	1,757	16.85	29,603.75
Outlet, reinforced.....do.....	48	24.60	1,181.75
Do.....do.....			10,439.88
Riprap.....cubic yards.....	432	5.48	2,355.60
Backfill.....do.....			5,324.49
Six 20 foot by 10 foot radial gates.....pounds.....	88,665	.20	17,526.99
Two 4 foot by 4 foot high-pressure emergency gates.....do.....	95,920	.19	18,779.90
Two 48-inch balanced needle valves.....do.....	44,055	.26	11,606.57
54-inch riveted steel outlet pipe.....do.....	89,375	.12	10,860.66
Gates.....do.....			730.58
Structural steel.....do.....			1,377.58
Hand railing.....do.....			469.99
Lghting system.....do.....			2,941.38
Electric installation.....do.....			2,365.11
Right of way and lands.....do.....			176,133.25
Permanent improvements (gate tender's cottage).....do.....			3,097.19
Camp maintenance.....do.....			34,449.20
Engineering and inspection.....do.....			49,955.27
Total estimated field cost.....do.....			2,018,312.71
Superintendence and accounts.....do.....			43,353.41
General expense.....do.....			55,161.98
Grand total actual cost.....do.....			2,116,828.10
Estimated cost.....do.....			2,500,000.00

### OUTLET WORKS

The release of water from the reservoir for irrigation purposes is effected by means of a tunnel and two 48-inch balanced needle valves. The tunnel is located in the right abutment and was used to divert the stream flow during the construction of the fill. The total length of the tunnel, which is concrete lined throughout, is 705 feet, the upper 550 feet being a 10-foot horseshoe section. At the upper end of the tunnel is a reinforced concrete trash rack. The trash bars are five-eighths inch by 6 inches in section placed 6 inches center to center. The upper 550 feet of tunnel operates under pressure at all times. At the lower end of this section are mounted two 4 feet by 4 feet high-pressure emergency gates. From each of these gates a riveted steel pipe 54 inches in diameter delivers the water through the remaining 155 feet of tunnel to the 48-inch balanced needle valves at the downstream toe of the dam. These needle valves and the control mechanism

are housed in a reinforced concrete house connecting with the lower end of the tunnel. Access to the emergency gates in the tunnel is through the needle-valve house.

The tunnel, which is in hard blue basalt and the softer forms of lava, was driven from both portals. No timbering was required and the excavation was completed in approximately three months. The tunnel muck was placed in the drain trench at the downstream toe of the dam.

### SPILLWAY

The spillway is of the side-channel type, concrete lined, and is located in the lava rock in the right abutment. The spillway structure consists of a double-barrel siphon, the throat of each unit being 8 feet 6 inches wide by 2 feet 6 inches high and six 20-foot by 10-foot motor-operated radial gates designed to pass 10,000 second-feet with reservoir surface at top of the gates. Two of the

(Continued on p. 172)

# Accounting Procedure in the Bureau of Reclamation as Affected by Recent Legislation<sup>1</sup>

By William F. Kubach, Chief Accountant

RECENT legislation necessitates material changes in the set-up of the financial accounts of each project. The contracts made with water users' organizations are very dissimilar and it is impossible to devise a standard uniform accounting procedure to be followed as was done under the extension act of August 13, 1914. The financial accounts for each project must be arranged to reflect the transactions peculiar to the respective projects.

The most recent legislation which requires a change in procedure is the appropriation act for the fiscal year 1928. Where the care, operation, and maintenance of a project or a division of a project have been or will be assumed by the water users' organization in the near future, and the contract with that organization provides for advance payment of the entire or a pro rata share of the cost of operation and maintenance of the entire irrigation system or reserved works, only partial or no appropriation has been made, it being the theory of Congress that operation and maintenance should be financed as far as possible by funds advanced. The act provides that any moneys that have been heretofore or may

<sup>1</sup> Address at Denver Conference, March, 1928.

be hereafter advanced for operation and maintenance of any project or any division of a project shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which advanced in like manner as if such funds had been appropriated specifically for that purpose.

This requires the financing from advance funds of the purchase of all material and supplies, equipment, etc., necessary for operation and maintenance. The practice of charging to operation and maintenance costs materials and supplies as used and depreciation of plant and equipment must be materially changed especially where the operation and maintenance of a project is being financed entirely by advanced funds, and the water users' organization agrees to assume the book values of inventories and plant and equipment when the operation and maintenance is assumed at a later date. Apparently all purchases made from advanced funds must be ear-marked to distinguish them from items purchased with Government funds, to enable the correct determination of the liability assumed by the districts, while materials and supplies and equipment purchased

with Government funds must be properly accounted for and charged against the funds advanced as used.

## INCREASE IN FUND ACCOUNTING

The appropriation act for 1928 carries separate items for specific purposes. This will greatly increase our fund accounting so as to guard against exceeding the limitations stated for the separate items under each project. Greater care must be exercised to see that the moneys appropriated are expended for the purposes authorized. Expenditures for the purposes enumerated for each project can exceed the amount only by invoking the 10 per cent interchange provision of the act. Moneys specifically appropriated for the drainage system can not be diverted to operation and maintenance or other features of the same project except on prior authority for such interchange.

The appropriation act for 1928 carries a separate item for the Washington office, and it will be unnecessary in 1928 to reserve from each project's appropriation a percentage to provide an allotment of funds for that office.

The fact finders' act and the adjustment act require sweeping changes in our accounts. The funding of so large an amount of delinquent charges, interest, and penalties into the construction indebtedness changes entirely the construction and the operation and maintenance groups. It is no longer possible to compare the value of water-right contracts with the net construction cost, as many items used in the determination of the net construction cost will be, under subsections I and J, a direct credit to the water users' accounts, and the construction group set-up must be changed. Many new accounts must appear in this group to determine properly the indebtedness of the water users. The terms "Net construction costs" and "Net operation and maintenance costs" have become obsolete. In order to reflect the results of the adjustment act the charge-offs must be recorded. Many, no doubt, have considered the items appearing in the adjustment act as the final determination of such charge-off. This, however, is not true. The charge-offs must be determined from the individual water-right contract values, where the permanently unproductive lands are covered by water-right application, and

## McKay Dam Construction

(Continued from p. 171)

radial gates are automatic, being controlled by float switches located in wells in the adjacent piers. The gate-operating mechanism is located directly over the gates on a reinforced concrete deck.

The spillway excavation of 31,000 cubic yards of rock was drilled with jack hammers, shot, moved to the lower end of the spillway with a power-operated drag bucket, and loaded into 4-yard dump cars and placed in the rock drain at the downstream toe of the embankment.

### CONCRETE AGGREGATES

Sand for concrete was not available at the dam site and was shipped by railroad from Hermiston, a distance of 42 miles, and hauled by truck 2½ miles. The cost at the mixer was \$2.50 per cubic yard. Gravel for concrete was obtained about 1 mile above the dam. The cost of excavating, screening, wash-

ing, crushing, and hauling to the mixing plant was estimated at \$1.80 per cubic yard.

Extensive tests were made by the Bureau of Standards in Denver on various available aggregates for concrete before the decision was reached to use local gravel and Hermiston sand. All sands in this region are rather fine and very poorly graded. The resulting mixed aggregate was deficient in coarse sand and pea gravel. This deficiency was later corrected to a certain extent by the addition of local aggregates selected for this purpose.

The accompanying drawing shows the general plan and sections through the spillway, outlet works, maximum section, and various details. The tabulated cost gives the actual construction quantities, unit costs, and both the estimated and actual total cost. (See back cover page.)



whether or not the landowner accepts the land classification.

Where contracts have been made for joint liability, and the charges are to be collected through irrigation district assessments or taxes, it is impossible to maintain individual repayment records. In fact, it is the plan of the contracts that the United States will withdraw completely from such work. After the district has been assisted in establishing financial records, and the individual must look to the district for the status of his account, it is planned to divorce the repayment accounts from the projects, billing and collecting the accounts in the Washington office. This plan must be followed where a project has been completely turned over, and it does not seem that the repayment books are essential to a project office where only reserved works are being operated and maintained by the bureau.

We are working on a new form of financial statement to carry many new accounts. We are also working on a standard classification of accounts for the irrigation districts and associations to be submitted to the bureau in order that we may be kept informed as to their financial standing.

#### SUSPENSION OF CHARGES

The procedure heretofore followed in handling suspensions of charges against temporarily unproductive lands must be changed. The regulations now in effect provide that in the case of temporary suspensions the installments of construction charges will be collected thereafter upon the remaining irrigable area and shall be computed upon the basis of the portion of the construction charges unpaid less the total construction charge on the area temporarily eliminated, and that whenever the total amount paid by a water-right applicant shall equal the amount of the construction charge on the total irrigable area, less the eliminated area, further collections of water-right construction charges from such applicant shall be suspended.

Under this procedure it is plain that the payments theretofore made for temporarily suspended land are diverted to the benefit of charges against the productive area. This is not contemplated by the adjustment act. The theory is that construction charges unpaid and unaccrued, together with the payments heretofore made, will be placed in suspense. That is, the debits as well as the credits are suspended. The procedure heretofore in effect has also resulted in the water-right applicant paying annual installments on an erroneous base rate. The whole procedure is mathematically incorrect and not in harmony with the adjustment act.

#### FISCAL RELATIONS OF THE WATER USERS' ORGANIZATION

It is apparent where a water users' organization has been designated a fiscal agent of the United States for the collection of construction charges from non-consenting land owners and for the collection of other amounts due or to become due to the United States, that the fiscal relations of the organization to the United States are not fully understood. The fact that the water users' organization has assumed joint liability of the construction indebtedness of the nonconsenting lands and will itself make payment if the nonconsenting landowner fails or refuses to make payment, does not relieve the organization from the proper accountability under its bond as

fiscal agent of the United States. It is expected that the moneys so collected will be turned over to the United States within a reasonable time, and failure to do so will be sufficient cause for action under its surety bond. Moneys so collected can not be withheld and diverted to other uses, on the assumption that the United States is amply protected by the joint liability provision of the contract.

The water users' organization, although designated a fiscal agent of the United States by its contract, should not be permitted to make collection of moneys due the United States until surety bond has been furnished and accepted by the department. After the bond has been accepted, instruction will issue for accounting for moneys collected as such fiscal agent.

The limited time allotted makes it impossible to cover all the changes in accounting procedure that are necessary. A few of the more important changes only have been discussed.

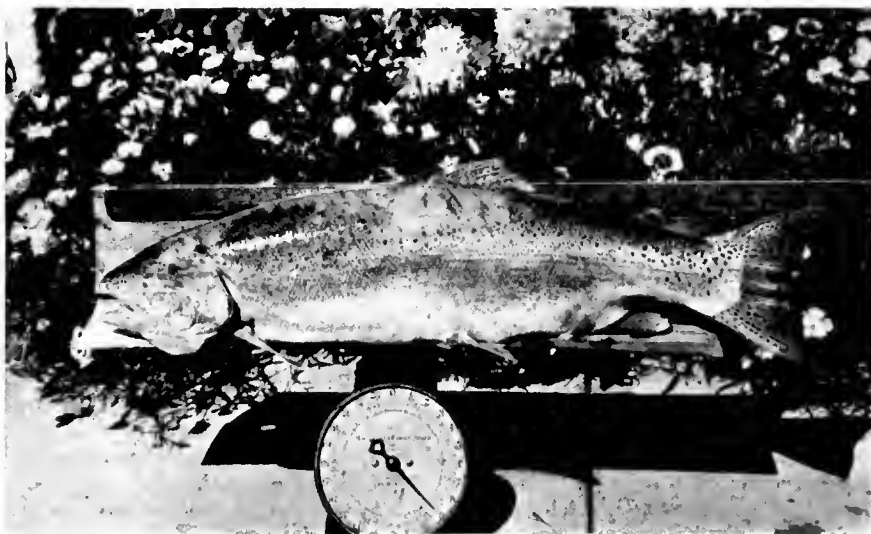
#### Interior Department Buys Shoshone Honey

Forty employees of the Department of the Interior, from the Secretary's office, the National Park Service, and the Bureau of Reclamation, in Washington, D. C., have sent an order to Mr. H. F. Krueger of Powell, Wyo., a water user on the Shoshone irrigation project, for 260 pounds of honey. This opportunity to obtain an excellent grade of honey at an attractive price resulted from the recent visit to the project by Mr. Kreutzer, Director of Reclamation Economics, who passed the word along to the employees of the Bureau of Reclamation on his return to the Washington office.

The office is open to suggestions for the purchase of other products from our projects.

#### Reservoir for Project Stocked with Fish

One hundred and eighty-seven cans of fish were received at the Elephant Butte Dam, Rio Grande project, New Mexico-Texas, on September 23 from LaCrosse, Wis. The shipment consisted of black bass, sunfish, ring perch, and crappie, which were placed in the reservoir. Twelve cans of catfish received at the same time and 12,000 fingerling trout from the New Mexico State hatchery were placed in the Rio Grande below the dam. The State game warden of New Mexico received the shipments and supervised the distribution of the fish.



Nine-pound rainbow trout caught in Pishkun reservoir, Sun River project, Mont.



## NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, under the authority of the Commissioner of Reclamation and the Secretary of the Interior.

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation. Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C.

## Increased Irrigation Development in Egypt

THE new barrage at Nag Hammadi forms the next step in the irrigation development of the Nile, which commenced in 1899 with the construction of the Assouan Dam, followed by the Esna Dam built in 1908, and the Sennar Dam opened in January, 1926.

The site for the proposed barrages which will be over half a mile in length, is situated some 500 miles up the river between the existing barrages of Assiut and Esna. The object of the barrage is to raise the level of the river sufficiently to irrigate an area of approximately 500,000 acres at all seasons of the year, formerly only possible at a time of high flood.

This will enable two crops per year to be grown instead of one, and also avoid

risks of incomplete irrigation, due to low levels and consequent failure of crops.

Roller-type gates will be fitted to the 100 openings in the main barrage and six openings in the irrigation canal. Each opening is provided with two gates of 6 meters span running in parallel grooves, which will permit their being lifted out separately if desired. These gates have a depth of 6.1, 7.1, and 8.1 meters, respectively, according to their position on the barrage. Two power-driven machines traveling on rails on top of the barrage will be provided for operating the gates to regulate the flow of water through the openings and for removing the gates when necessary. A small machine will work on the canal head for the regulation of the gates controlling the flow of water into the canal. The contract price of these gates approximates \$850,000.

## Construction Work at Gibson Dam Sun River Project, Montana

By Rolph Lowry, Construction Engineer

CONCRETE aggregate is obtained from a natural deposit located on the right bank of the north fork of Sun River, about 1,500 feet downstream from Gibson Dam. The pit-run material is excavated by a Bucyrus 50-B steam shovel, loaded into 4-yard cars, and hauled by an 18-ton dinky to the gravel plant, which is located on the right bank of the river, about midway between the gravel pit and the dam. At the gravel plant the pit-run material is dumped over a grizzly, the oversize rock passing through a jaw crusher onto a conveyor belt which travels beneath the grizzly. The crushed oversize, together with the material passing through the grizzly, is carried by the belt and discharged into the screening plant, where, with the addition of water, the material is washed and segregated into the various sizes.

The sand is carried down by the water into an auxiliary sand washer located underneath the screen. The four sizes of aggregate, including the sand, are then carried by belt conveyors and dumped into the various stock piles which are located on a line between the screening and mixing plants. On the way to the stock pile material is taken from the coarse rock conveyor and put through a Symons cone crusher for producing sand to supplement the supply of natural sand

which is deficient. The product from the cone crusher is elevated by bucket conveyor and is run over a Hummer screen, the oversize from which falls onto the pea gravel belt conveyor, the sand passing through the screen and onto the stock pile directly below. A tunnel extends underneath all the stock piles, through

which a belt conveyor travels which runs up an incline to the top of the mixing plant. This plant is located about 300 feet toward the dam from the end of the stock pile. Release of material from the stock piles is controlled by manually operated gates in the tunnel. The aggregate, after passing through the gates and onto the conveyor, is transported to the top of the mixing plant, where it is dropped into the proper storage bin.

The various sized aggregate is released with one operation, by a manually controlled mechanism, from the storage bins into the measuring bins, directly below, and from the measuring bins the aggregate is dropped in the mixer hopper underneath. The cement is dumped into the mixer hopper by means of a chute, after being transported by a belt conveyor, from the 60-car capacity cement warehouse, located nearby, to a floor of the mixing plant, adjacent to and on the same elevation as the storage bins. All material for one batch is dumped from the hopper into the 2-yard, motor operated, Smith tilting mixer. The mixing plant contains two separate mixers with auxiliary hoppers, measuring bins, etc. The concrete, after being mixed, is dumped into 2-yard concrete cars and hauled by 7-ton gas dinkies to the dam, where the concrete is elevated and distributed by means of tower and chutes.

The exercise of selection, wisely and judiciously pursued, gives the breeder an important advantage over others who leave the mating of their animals largely to chance.

## An Advertising Hint

*The Fallon Eagle, formerly the Churchill County Eagle, now carries as its main front page heading a reproduction of a sketch of the Lahontan Dam, Newlands project, drawn by J. Malm, an artist who is the owner of a farm in the Lone Tree district. Mr. Malm takes a great deal of interest in the development of the project's resources and in bringing them to the attention of outsiders. Commenting on the heading the Eagle says:*

*"When other communities have suffered for lack of water for irrigation, storage of flood waters in the Lahontan Reservoir has afforded ample supply for all crops. This year there is almost enough water to take care of next year's crops."*

## Reclamation Organization Activities and Project Visitors

**D. R. ELWOOD MEAD**, Commissioner of Reclamation, returned to the Washington office on October 5 after a two months' trip to Palestine for a study of the colonization work of the Zionist organization.

**R. F. Walter**, chief engineer, spent a week at Albuquerque, N. Mex., with the consulting board of the middle Rio Grande conservancy district, going over the plans of the district which proposes to irrigate lands in the Rio Grande Valley between White Rock Canyon and San Marciel.

**George C. Kreutzer**, director of reclamation economics, and **S. L. Jeffords**, special investigator, left the Washington office on October 12 for a trip to a number of the Southern States to investigate properties suggested by the respective States in connection with the study now being made by the bureau of opportunities for planned group settlement in the South.

The temporary appointment of **James J. Doland**, assistant engineer in the designing section, Denver office, has been terminated to enable him to return to his position on the teaching staff of the College of Engineering, University of Illinois.

**Alfred C. Jaquith**, formerly employed as an engineer in the designing section of the Denver office, died in Mexico City on September 23.

**J. G. Teicher**, secretary of the thirteenth civil service district, and **Superintendent Nusbaum**, of the Mesa Verde National Park, spent several days on the Uncompahgre project, during which they conducted an examination for park ranger, inspected the project, and visited the Western Slope Fair.

**B. H. Creighton**, of the Department of Commerce, was in Burley, Minidoka project, for several days surveying landing fields and making arrangements for beacon lights on the air-mail route.

Recent visitors on the Milk River project included Senators **Walsh** and **Wheeler**, **W. H. Wattis**, **W. Y. Cannon**, and **David Scott**, of the Utah-Idaho Sugar Co.; and **C. D. Greenfield**, agricul-

tural development agent of the Great Northern Railway Co.

A party of irrigation officials from Canada visited the Sun River project recently and inspected the distribution system and the development of the irrigable lands. The party included **L. C. Charlesworth**, chairman, irrigation council, Edmonton, Alberta; **P. M. Sanders**, project manager, Lethbridge northern irrigation district, Lethbridge; **G. F. Hilliard**, water master, Picture Butte; **C. S. Clendenning**, water master, Commerce; **A. J. Branch**, water master, Monarch; **W. R. Brookes**, water master, Macleod; and **C. Asplund**, project manager, United irrigation district Glenwoodville.

A recent press dispatch from Salt Lake City states that **Dr. John A. Widtsoe**, former member of Secretary Work's fact finding committee on the reclamation projects, has been named head of the European mission of the Church of Jesus Christ of Latter-day Saints, succeeding **Dr. James E. Talmage**. Doctor Widtsoe's headquarters are stated to be in London.

**Val Kuska**, colonization agent of the Chicago, Burlington & Quincy Railroad, and **R. A. Smith**, supervisor of agriculture of the Union Pacific system, were on the North Platte project recently in connection with settlement matters.

Associate Engineer **D. C. Caylor** has been placed in charge of the remaining construction work in the Elephant Butte irrigation district, Rio Grande project, and Assistant Engineer **M. W. Bushman** transferred to the El Paso Valley district where he will assume charge of the remaining construction work in that district.

### *Automobiles Increase In Yakima County*

During the first 11 days of August 585 automobile licenses were issued by the auditor's office of Yakima County, Wash., in which the Yakima irrigation project is located. In addition, 165 transfers were granted. Licenses issued up to August 12 totaled 21,310, or 1,130 more than had been issued up to the corresponding date last year.

A conference was held at Klamath Falls, Klamath project, by **Hon. Paul G. Redington**, Chief of the Bureau of Biological Survey, with **Ray Steel**, Federal game warden for Oregon; **L. T. Jessup**, associate drainage engineer, Department of Agriculture; and others relative to the situation on Lower Klamath Lake affecting bird life.

**E. K. Humphrey**, of the Oregon State engineer's office, spent two days on the Klamath project conducting tests of the pumping plants of the Malin and Shasta View irrigation districts.

**Dr. F. L. Ransome**, geologist, was on the Owyhee project for a number of days making a geological examination of the reservoir and dam site.

**S. O. Harper**, superintendent of construction, made an inspection of needed repairs on canals on the Belle Fourche project and conferred with **Drainage Engineer Iakisch** on the location and construction of the drainage work for 1928.

**J. C. McDonald**, comptroller of water rights in the department of lands, Victoria, British Columbia, visited the Okanogan project to obtain information relative to reclamation on this side of the line.

**D. J. Calkins**, of the Tacoma office of the Geological Survey, spent a day on the Yakima project checking gauging stations maintained by the bureau and obtaining stream flow data.

Congressmen **Louis C. Cramton**, **Burton L. French**, **Edward T. Taylor**, and **Charles E. Winter**, and **Gov. Frank C. Emerson**, of Wyoming, visited the River-ton project on September 30.

**Porter J. Preston**, superintendent of the Yuma project, and **Charles A. Engle**, supervising engineer, Indian irrigation service, who, with **Ray P. Teele**, who died recently, have been making a survey of irrigation methods and practices on reclamation and Indian irrigation projects, are spending some time in the Washington office in connection with their report.

**John S. Moore**, assistant engineer on the Yakima project visited the Washington office recently.

**STATEMENT OF ACCRETIONS TO THE RECLAMATION FUND AND EXPENDITURES BY THE FEDERAL GOVERNMENT FOR CONSTRUCTION AND OPERATION OF RECLAMATION PROJECTS, INCLUDING PROPOSED 10-YEAR PROGRAM TO COMPLETE PROJECTS UNDER CONSTRUCTION (COLUMN 4), BY STATES, JUNE 30, 1927**

(1) State and projects	(2) Accretions to reclamation fund to June 30, 1927	(3) Expended for construction of reclamation projects to June 30, 1927	(4) Estimate to complete under 10-year program	(5) Actual and estimated final construction cost (total of columns 3 and 4)	(6) Expended for operation and maintenance to June 30, 1927	(7) Total expenditures for construction and operation and maintenance (total columns 3 and 6)
Arizona:						
Salt River.....		\$15,106,942.10		\$15,106,942.10		\$15,106,942.10
Yuma <sup>1</sup> .....	\$2,269,736.56	8,392,971.90	\$1,291,000.00	9,683,971.90	\$2,477,050.85	10,870,022.75
Total Arizona.....		23,499,914.00	1,291,000.00	24,790,914.00	2,477,050.85	25,976,964.85
California:						
Orland.....		1,634,478.64	727,000.00	2,361,478.64	334,845.39	1,969,324.03
Yuma <sup>1</sup> .....		1,593,194.59		1,593,194.59	743,115.26	2,336,309.85
Klamath <sup>1</sup> .....	13,677,933.85	1,795,887.41	1,581,000.00	3,376,887.41	23,469.17	1,819,356.58
Total California.....		5,023,560.64	2,308,000.00	7,331,560.64	1,101,429.82	6,124,990.46
Colorado:						
Grand Valley.....		5,280,260.58	136,000.00	5,416,260.58		5,280,260.58
Uncompahgre.....	10,076,128.83	7,928,760.97	500,000.00	8,428,760.97	635,118.86	8,563,879.83
Total Colorado.....		13,209,021.55	636,000.00	13,845,021.55	635,118.86	13,844,140.41
Idaho:						
King Hill.....		1,904,898.80		1,904,898.80	156,734.25	2,061,633.05
Minidoka.....		7,122,208.47	325,000.00	7,447,208.47	1,886,428.64	9,008,637.11
American Falls.....		7,543,266.63	3,479,000.00	11,022,266.63		7,543,266.63
Gravity extension unit.....		18,835.09	4,981,164.91	5,000,000.00		18,835.09
North side extension.....	6,973,822.57	5,169,000.00		5,169,000.00		
Boise <sup>1</sup> .....		14,988,233.38	6,334,000.00	21,322,233.38	2,623,152.05	17,611,385.43
Owyhee <sup>1</sup> .....		62,264.27	5,937,735.73	6,000,000.00		62,264.27
Total Idaho.....		31,639,706.64	26,225,900.64	57,865,607.28	4,666,314.94	36,306,021.58
Kansas: Garden City.....	1,032,764.48	395,831.78		395,831.78		395,831.78
Montana:						
Huntley.....		1,499,250.67	60,000.00	1,559,250.67	1,002,125.26	2,501,375.93
Milk River.....		7,421,095.12	181,000.00	7,602,095.12	76,373.56	7,497,468.68
Sun River.....	15,757,830.07	4,863,790.45	3,653,000.00	8,516,790.45	248,879.43	5,112,669.88
Lower Yellowstone <sup>1</sup> .....		2,088,270.19	300,000.00	2,388,270.19	734,064.22	2,822,334.41
Total Montana.....		15,872,406.43	4,194,000.00	20,066,406.43	2,061,442.47	17,933,848.90
Nebraska: North Platte <sup>1</sup> .....	2,088,546.91	15,047,363.94	707,000.00	15,754,363.94	2,579,155.18	17,626,519.12
Nevada: Newlands.....	954,162.32	7,688,013.34	1,164,000.00	8,852,013.34	1,452,926.96	9,140,940.30
New Mexico:						
Carlsbad.....		1,463,265.57	1,001,000.00	2,464,265.57	671,247.20	2,134,512.77
Rio Grande <sup>1</sup> .....		8,416,798.56	750,000.00	9,166,798.56	939,838.12	9,356,636.68
Hondo.....	5,989,951.30	381,573.39		381,573.39		381,573.39
Total New Mexico.....		10,261,637.52	1,751,000.00	12,012,637.52	1,611,085.32	11,872,722.84
North Dakota:						
Buford-Tranton.....		223,423.06		223,423.06		223,423.06
Williston.....		517,630.09		517,630.09	979,443.11	1,497,073.20
Lower Yellowstone <sup>1</sup> .....	12,227,913.28	1,087,323.17	160,000.00	1,247,323.17	382,210.69	1,469,533.86
Total North Dakota.....		1,828,376.32	160,000.00	1,988,376.32	1,361,653.80	3,190,030.12
Oregon:						
Umatilla.....		5,157,624.17		5,157,624.17	678,811.02	5,836,435.19
Klamath <sup>1</sup> .....		3,579,880.53	250,000.00	3,829,880.53	877,080.59	4,456,961.12
Vale.....		117,397.37	2,997,602.63	3,115,000.00		117,397.37
Owyhee <sup>1</sup> .....	11,741,729.84	124,528.55	11,589,471.45	11,714,000.00		124,528.55
Boise <sup>1</sup> .....		483,210.00		483,210.00	67,109.75	550,319.75
Total Oregon.....		9,462,640.62	14,837,074.08	24,299,714.70	1,623,001.36	11,085,641.98
South Dakota: Bella Fourche.....	7,773,550.98	3,566,124.41	1,180,000.00	4,746,124.41	1,271,715.37	4,837,839.78
Texas: Rio Grande <sup>1</sup> .....		6,756,195.58	420,000.00	7,176,195.58	815,326.11	7,571,521.69
Utah:						
Strawberry Valley.....		3,519,935.39		3,519,935.39	437,856.39	3,957,791.78
Salt Lake Basin.....	4,011,593.63	54,848.50	12,345,151.50	12,400,000.00		54,848.50
Total Utah.....		3,574,783.89	12,345,151.50	15,919,935.39	437,856.39	4,012,640.28
Washington:						
Okanogan.....		1,465,097.27	320,000.00	1,785,097.27	603,070.18	2,068,167.45
Yakima.....	7,345,256.13	14,416,976.88	18,879,000.00	33,295,976.88	3,413,458.21	17,830,435.09
Kittitas.....		557,464.06	8,442,535.94	9,000,000.00		557,464.06
Total Washington.....		16,439,538.21	27,641,535.94	44,081,074.15	4,016,528.39	20,456,066.60
Wyoming:						
Riverton.....		2,843,489.47	5,195,000.00	8,038,489.47		2,843,489.47
Shoshone.....	32,653,132.94	9,427,434.57	5,193,000.00	14,620,434.57	856,969.31	10,284,403.88
North Platte <sup>1</sup> .....		4,776,764.34		4,776,764.34	74,091.56	4,850,855.90
Total Wyoming.....		17,047,688.38	10,388,000.00	27,435,688.38	931,060.87	17,978,749.25
All States: Secondary.....		2,574,438.29		2,574,438.29		2,574,438.29
Miscellaneous accretions:						
Alabama.....	46,653.97					
Louisiana.....	10,062.16					
Oklahoma.....	5,926,039.19					
Federal water power licenses.....	31,442.41					
Grand total.....	140,588,251.42	183,887,241.54	105,248,662.16	289,135,903.70	27,041,666.69	210,928,908.23

<sup>1</sup> Interstate project—expenditures for construction and operation and maintenance prorated on area basis.

# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.....	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.....	R. J. Newell.....	W. L. Vernon.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Carlsbad.....	Carlsbad, N. Mex.....	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.....	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.....	H. M. Schilling.....	J. P. Siebeneicher.....	.....	E. E. Roddis.....	Billings, Mont.
King Hill <sup>2</sup> .....	King Hill, Idaho.....	.....	.....	.....	.....	.....
Klamath.....	Klamath Falls, Oreg.....	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.....	H. A. Parker.....	E. R. Schepplmann.....	E. E. Roddis.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.....	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	Do.
Minidoka <sup>3</sup> .....	Burley, Idaho.....	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Newlands <sup>4</sup> .....	Fallon, Nev.....	A. W. Walker.....	Erle W. Shepard.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte <sup>5</sup> .....	Mitchell, Nebr.....	H. C. Stetson.....	Virgil E. Hubbell.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.....	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Oreg.
Orland.....	Orland, Calif.....	R. C. E. Weher.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Owyhee.....	Nyssa, Oreg.....	F. A. Bauks.....	.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Rio Grande.....	El Paso, Tex.....	L. R. Flock.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.....	H. D. Comstock.....	R. B. Smith.....	R. B. Smith.....	Wm. J. Burke.....	Mitchell, Nebr.
Salt Lake Basin.....	Salt Lake City, Utah.....	E. O. Larson.....	.....	.....	.....	.....
Salt River <sup>6</sup> .....	Phoenix, Ariz.....	.....	.....	.....	.....	.....
Shoshone <sup>7</sup> .....	Powell, Wyo.....	L. H. Mitchell.....	W. F. Sha.....	Mrs. O. C. Knights.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley <sup>8</sup> .....	Provo, Utah.....	.....	.....	.....	.....	.....
Sun River <sup>9</sup> .....	Fairfield, Mont.....	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Umatilla <sup>10</sup> .....	Hermiston, Oreg.....	.....	.....	.....	.....	.....
Uncompahgre.....	Montrose, Colo.....	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Vale.....	Vale, Oreg.....	H. W. Bashore.....	C. M. Voyer.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Yakima.....	Yakima, Wash.....	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	do.....	Do.
Yuma.....	Yuma, Ariz.....	P. J. Preston.....	H. R. Pasewalk.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

### Large Construction Work

North Platte, Guernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>11</sup> .....	.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kittitas.....	Ellensburg, Wash.....	Walker R. Young <sup>12</sup> .....	E. R. Mills.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gibson Dam.....	Angusta, Mont.....	Ralph Lowry <sup>12</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Dam site, Elk Creek, Calif.....	H. J. Gault <sup>12</sup> .....	C. B. Funk.....	.....	R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.

<sup>2</sup> Operation project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1926.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.

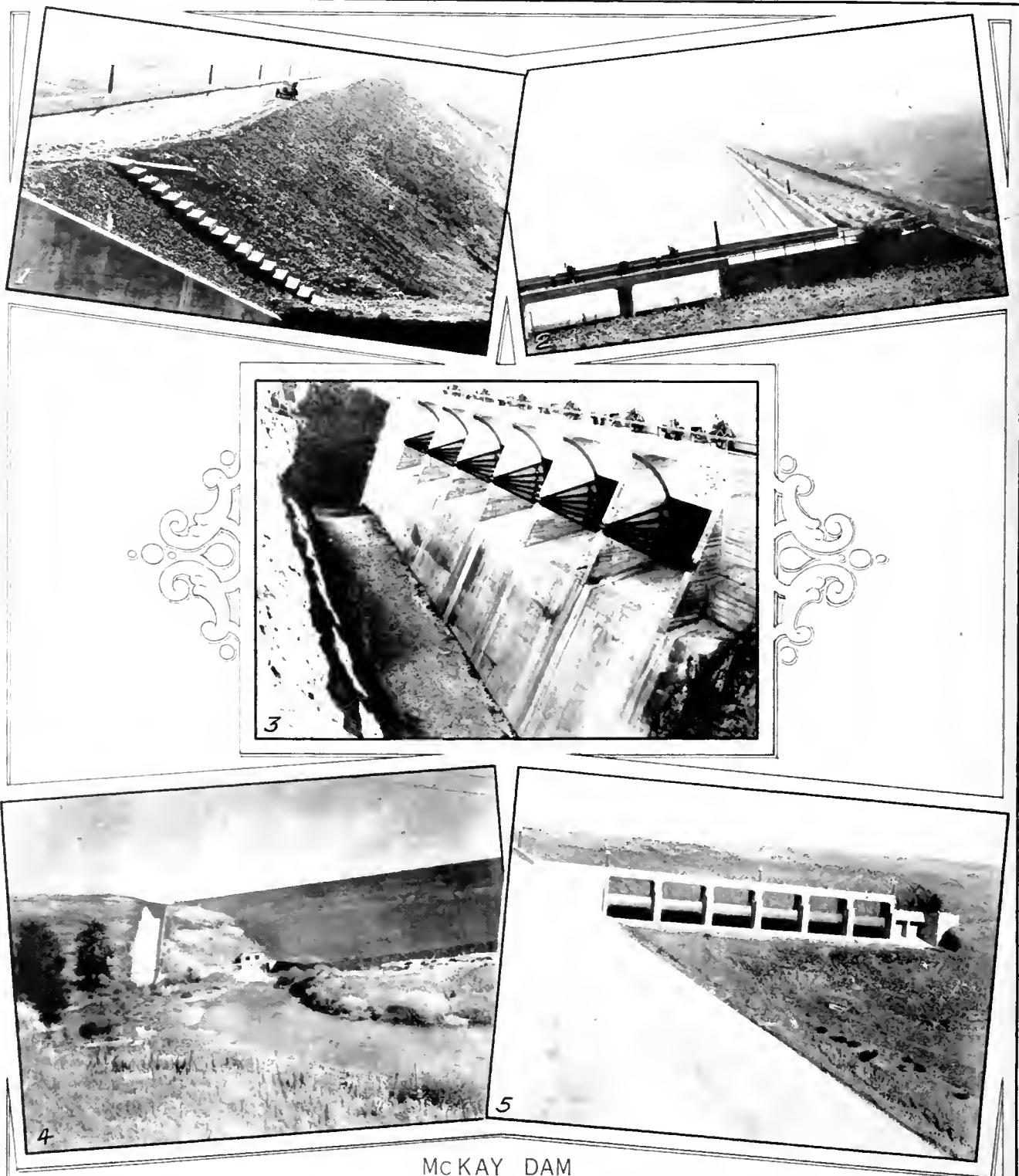
<sup>10</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.

<sup>11</sup> Resident engineer.

<sup>12</sup> Construction engineer.

### Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Cache la Poudre investigations.....	Denver, Colo.....	Thomas Hawthorne.....	Poudre Valley Water Conservation Association.
Middle Rio Grande.....	Albuquerque, N. Mex.....	C. C. Elder.....	Middle Rio Grande conservancy district.
Yakima project extensions.....	Yakima, Wash.....	J. L. Lytel.....	.....
Columbia Basin Project.....	Leid, Wash.....	B. E. Hayden.....	.....
Truckee River.....	Reno, Nev.....	A. N. Burch.....	.....
Heart Mountain investigations.....	Powell, Wyo.....	I. B. Hosig.....	.....
Southern investigations.....	Washington, D. C.....	C. A. Bissell.....	States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.



McKAY DAM  
UMATILLA PROJECT, OREGON

1. DOWNSTREAM SLOPE OF EMBANKMENT FROM ACROSS SPILLWAY
2. LOOKING SOUTHWEST ACROSS DAM
3. DOWNSTREAM VIEW OF RADIAL GATES
4. SPILLWAY, VALVE HOUSE, AND TOWER SLOPE OF EMBANKMENT
5. RADIAL GATES AND SIPHON SPILLWAYS



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V. 18, no. 12

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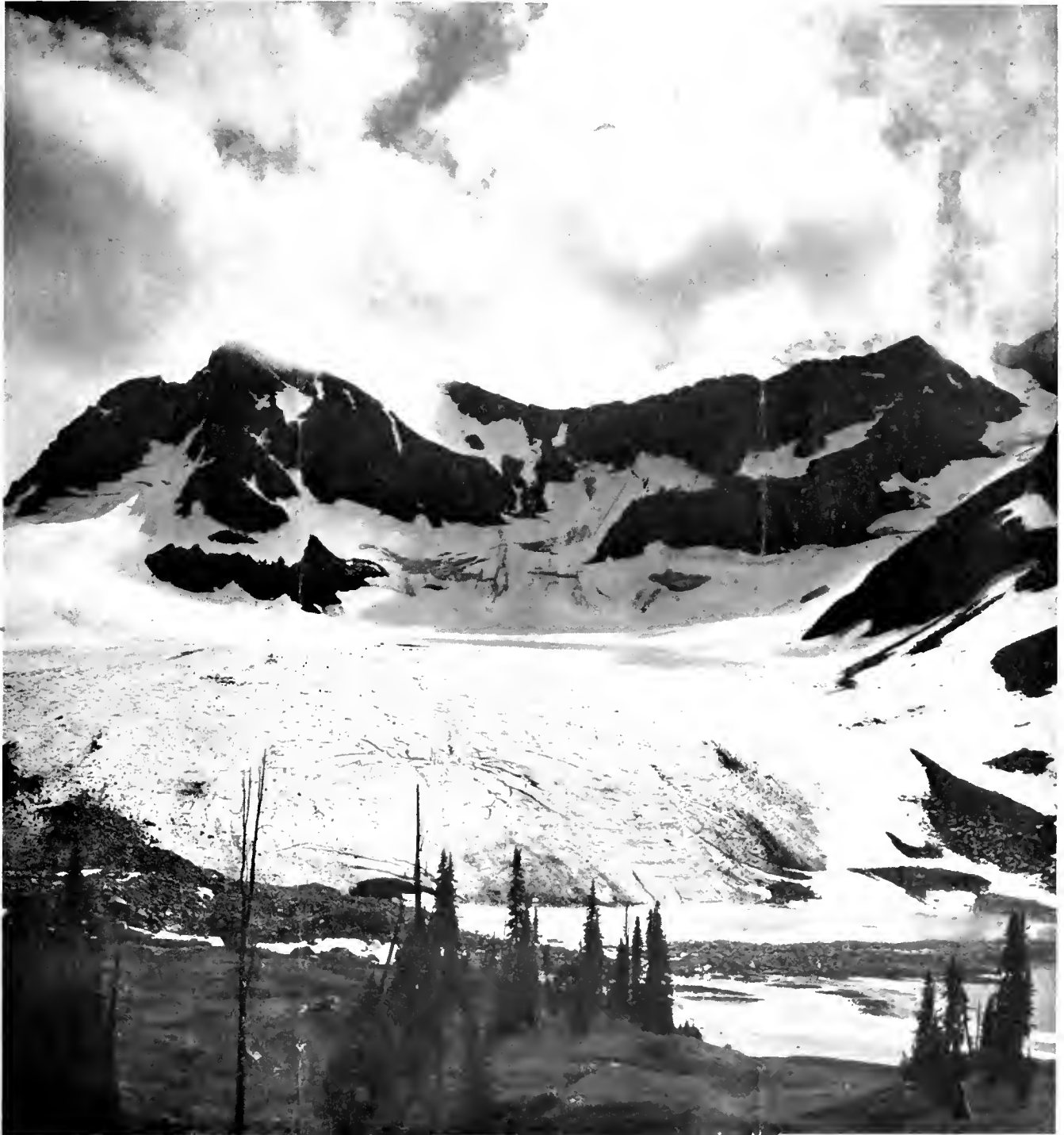
Kansas City, Mo.

# NEW RECLAMATION ERA

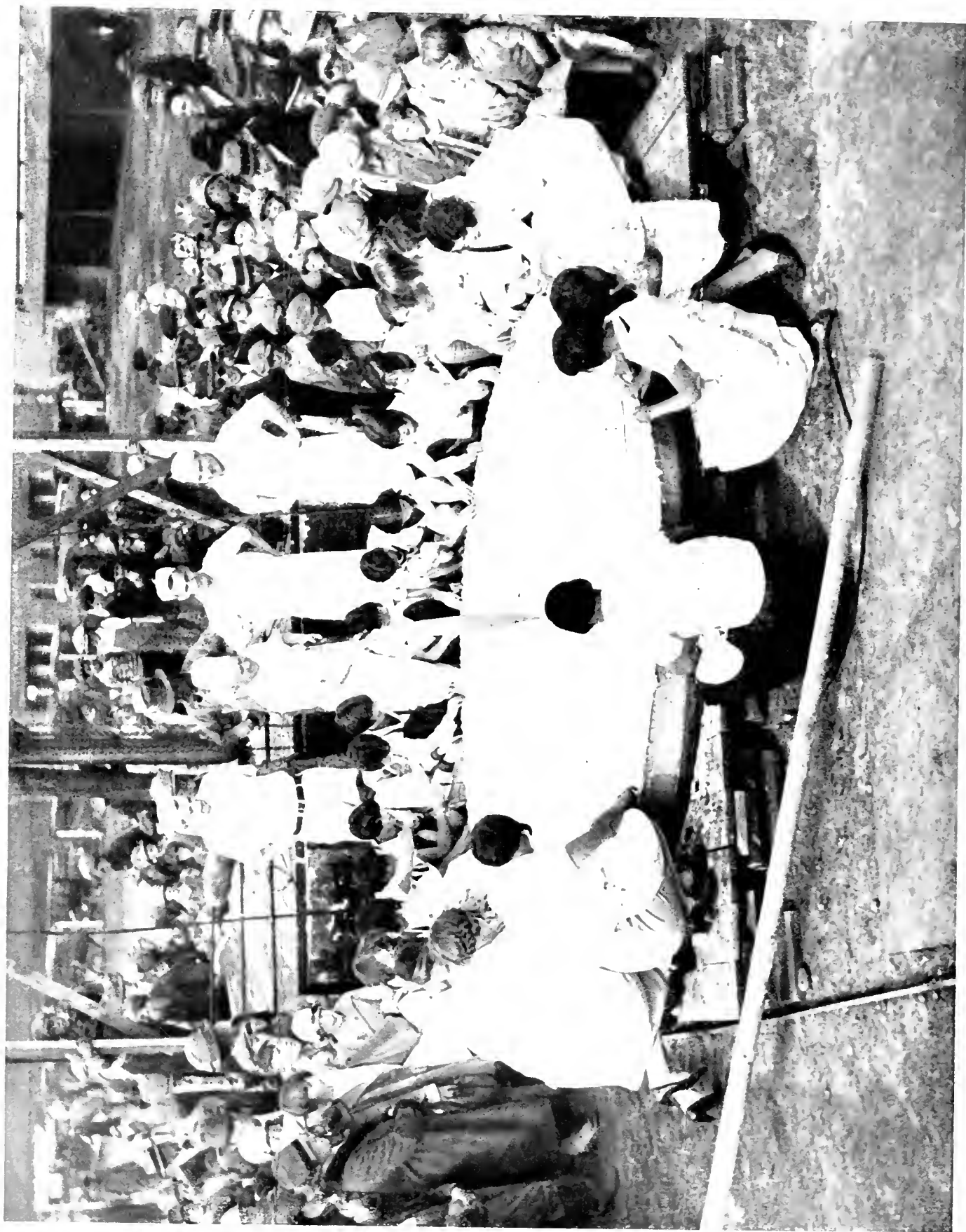
VOL. 18

DECEMBER, 1927

NO. 12



WINTER'S SNOWS, THE SOURCE OF THE PROJECT WATER SUPPLY



YAKIMA'S \$1,000, ONE-TON APPLE PIE (SEE PAGE 187)

# NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

Price, to others than project water users, 75 cents a year

HUBERT WORK  
Secretary of the Interior

ELWOOD MEAD  
Commissioner, Bureau of Reclamation

Vol. 18

DECEMBER, 1927

No. 12

## *Interesting High Lights on the Reclamation Projects*

**P**RESIDENT Coolidge received by air mail the first sack of sugar produced this year at the Fallon sugar factory, Newlands project, Nevada. The sack was purchased at \$1 a pound by George Wingfield, prominent banker and mining man, who came to Fallon from Reno for the opening of the factory.

**T**HE owners of all lands on the Vale project, Oregon, now owned or formerly owned by the Oregon & Western Colonization Co. and the Eastern Oregon Land Co. have executed the "excess" land contracts and "increased value" contracts for excess land and the "increased value" contracts for nonexcess land.

**W**ORK was pushed at Stony Gorge Dam, Orland project, to complete the foundations and buttresses within the cofferdam on the north channel of the creek up to an elevation that would be reasonably safe from winter floods.

**S**IX and one-half acres on the Milk River project yielded 15 tons of sugar beets per acre. On the Malta and Glasgow divisions 5,979 tons have been harvested from 600 acres, or an average of 9.9 tons per acre. The sugar content averaged 18¾ per cent, with a few beets running as high as 20 per cent.

**T**HE Chinook sugar factory, Milk River project, had sliced 15,000 tons of beets at the end of the month and manufactured 45,000 sacks of sugar. Operations closed about the middle of November.

**C**ONTRACTS were being signed for the 1928 beet crop on the Lower Yellowstone project, providing for \$6 minimum if the tonnage is less than 50,000; \$6.50 if less than 60,000; and \$7 for 70,000 tons or more. Under the sliding scale agreement additional bonuses will be paid if warranted by the sugar content and the price of sugar.

**T**HE returns to growers of sugar beets on the Minidoka project promise to be very gratifying. Estimates by sugar company officials place the average yield at about 13 tons per acre. About 1,000 acres were grown on the project. The base price is \$7.50 a ton with such bonuses as may be justified by the sugar market. The best yield reported at the end of the month was that of Tom Bell, who harvested 275 tons of beets from 10 acres.

**N**UMEROUS instances of returns of around \$100 per acre on alfalfa and clover seed have been reported by Minidoka project farmers. From 9 acres Thomas Anderson threshed 10,782 pounds of alfalfa seed, or an average of about 20 bushels per acre. William Schoenfeldt got 14,000 pounds of alfalfa seed from 13¾ acres, or about 17 bushels per acre. The seed was sold at 14½ cents a pound straight from the machine. Four Paul men gathered 3,150 pounds of alfalfa seed from roadsides and ditch banks, netting \$521, equivalent to a wage of \$9 per day each for their time.

**E**QUIPMENT for the manufacture of casein has been installed at the Burley plant of the Mini-Cassia Cooperative Dairymen's Association, Minidoka project. This produce is made from whole milk which the association began receiving from the farmers on November 1. Casein has many uses and finds a ready market. Some of the processes in which it may be utilized are the manufacture of paints, enamels, glue, cements, putty, imitation ivory, linoleum, fruit sprays, soap, etc., and in softening fibers, color printing, waterproofing, and photography.

**S**EVERAL water users on the Grand Valley project have purchased small bands of sheep, ranging from 100 to 300 head. This is considered an encouraging sign, as it seems certain that the practice of feeding the farm crop will result in an increased revenue to the grower.

**I**T is understood that the Kraft Cheese Co. contemplates the early opening of a cheese factory on the Uncompahgre project. A representative of the company was very much impressed with the natural dairy facilities in the valley and stated that a factory would be started if 5,000 cows could be guaranteed. It is estimated that 15,000 cows will be available, and that if the industry is started more cows will be brought into the project.

**T**HE Potato Growers' Association on the Klamath project has made arrangements with radio station KGW, of Portland, Oreg., to broadcast a 50-word message for six nights, advertising Klamath County's second annual potato show.

**A**BOUT 5,000 head of cows and calves are being pastured in the valley division, Yuma project, and being fattened for shipment to the Los Angeles market. Pasturage is mainly alfalfa, barley, and Sudan grass. Rates for pasturing are 7 cents a day per head for cows and 5 cents for yearlings.

**S**IX hundred acres of citrus trees on the Yuma Mesa will bear fruit this year, or approximately 66 per cent of the total acreage in unit B. The yield has been estimated at 10,000 to 12,000 boxes, or 250 to 300 tons of fruit. This crop, figured on a basis of 80 trees to the acre, will give an average yield of ¼ box per tree. Prices are expected to average 4 cents a pound, giving a return on the season's crop of \$20,000 to \$25,000.

**O**VERHAULING of the upper tier of balanced valves at Arrowrock dam, Boise project, showed that the difficulty in operation during the past two or three years was due to corrosion of the bronze surfaces on the inside of the cylinders and the outside of the pistons. After a thorough cleaning they operated as easily as when first installed.

# *Economic Notes from the Reclamation Projects*

## *Development and Settlement of Reclaimed Land<sup>1</sup>*

*By J. L. Lytel, Superintendent, Yakima Project, Washington*

UNTIL a few years ago the development of an irrigation project was thought to consist mainly of investigation as to the area of land available, sufficiency of water supply, engineering feasibility, and the construction of the works necessary to put water on the land. The settlement feature was given very little attention when the Reclamation Service was started. As development of projects proceeded and those started first reached the settlement stage, and the time for collection of charges arrived, it became apparent that the settlement feature was one of major importance.

It was therefore decided that careful consideration should be given soil, economic, and settlement conditions. Consequently, there were included in the features to be investigated on all new projects, and on all new divisions of old projects, detailed reports on soil and economic conditions. Soil and economic reports were also made on the reclamation projects previously constructed, particularly where settlement problems of any consequence were involved.

On some of the projects that have been developed a great deal of the land was in private ownership, and the advantages accruing to the land by the construction of irrigation works with interest-free Government money were capitalized, and the price of land to the new settler was increased accordingly.

This worked a great hardship on the new settlers and delayed both the rate of development and the payment of construction charges. It was therefore apparent that the matter of settlement required careful attention from the beginning of the project, and some plan must be devised for the prevention or limiting of speculation in the land in order to make it possible for the new settler to purchase it at a reasonable price.

With the experience gained during the past 25 years, a great deal more is known concerning the obstacles and difficulties confronting the development of land by irrigation than when the original Federal irrigation act was passed in 1902. Also the social and economic conditions in the United States have undergone marked changes since that time which make it necessary to handle irrigation development under more complete and comprehensive plans than those followed in the past.

With the greatly increased investments in irrigation works, the matter of the result that is to be secured from the lands, that will enable the repayment of the charges, must be given very careful consideration in order to lessen the risk of the investment as much as possible. The work of developing new projects should, therefore, include every important feature from the investigation to successful settlement and the final payment of all charges to the Federal Government, State, or other agency furnishing any part of the funds for the construction of irrigation works, the clearing and leveling of land, settlement, and the establishment of a successful farm plant and home. The bringing together of the two essential elements on which irrigated agriculture is founded is only the first important step in the development of the possibilities and just a good start on the job. Also it represents only a portion of the investment necessary.

### **FACTORS TO BE CONSIDERED**

After the irrigation water is on the land, many real problems remain, some of which are:

1. Clearing and leveling of farms, construction of farm buildings, etc.
2. Settlement.
3. Studies of the kind of crops that can be produced profitably, and expert advice to settlers.
4. Funds and credit for financing farm development.
5. Market for crops produced.

Unless the agency developing the project looks after these features and sees that they are properly provided for, they will retard the development of the project to the extent that the investment in the irrigation works will be jeopardized.

Farming has ceased to be a jumble of haphazard operations. It is a well-developed business, which is now receiving about as much attention as other big business of the Nation. On irrigation projects, settlers are needed with the right attitude toward farming. The expensive farm plant must be occupied by farmers who know something about farming and want to stay in the business and not by those who have had no experience in farming but feel they would like to try it for a while, with possibly the idea that in case they don't like it, or can not make a success, they can sell out at a high price, due to the advantages accruing to the

land from the existing irrigation works. Gambling of this or any other nature in farms on irrigation projects must be eliminated in order to insure the success of the farmer and the return of the cost of the development.

Since the successful development of an irrigation project must depend on the settler who goes on the land, the settlement feature should be given its proper share of attention. In an irrigation district, all lands included within its boundaries are jointly obligated to pay the construction and operation costs, and the failure of any settler to pay his assessments puts an additional burden on the settler who does pay. Nonresident owners, even if they pay their charges, are undesirable on project lands, as they are not in a position to do their part in community building, which is a very necessary feature on any project.

It would appear, therefore, that the agency developing the project is obligated to see that all settlers who are allowed to go on the lands are so equipped with experience, funds, and a desire to farm, and that they have at least a fair chance to succeed.

Allow the settler who possesses the proper qualifications to purchase a piece of good land at a reasonable price, with sufficient water, well-constructed irrigation works, and a reasonable annual charge, together with good farmers as neighbors, and he has a fair chance to succeed in establishing a home on the land. I sometimes wonder what kind of a person they have in mind when they talk about a settler. Whom do the builders of a project have in mind they are building for? This question should be gone into and a decision reached along with other important problems.

### **INSURING SUCCESS**

While the selection of settlers may primarily be for the purpose of insuring the success of the project from a financial standpoint, it may also be considered as an act on the part of the agency developing the project to discharge a duty it owes to every good settler who comes; namely, give them thrifty neighbors. It is an effort to insure the success of both the individual farmer and the community.

A farm may be considered as a factory that puts out certain articles for which there is assumed to be a demand, and an irrigation project is therefore made up

<sup>1</sup> Address delivered at the Oregon Irrigation Congress, Prineville, Oreg., October 13, 1927.



of a collection of factories or farms in which a very considerable amount has been invested, and these plants can not be run at a loss, or allowed to stand idle, without jeopardizing the investment in the project works.

The farmer is expected to become the owner, operator and manager of these plants, and the work of securing farmers is called settlement. Settlement may therefore be considered as an effort to interest the right kind of men in these farm plants, and it may be assumed that the nearer the development of the plants is to completion and the more desirable they are, the better the grade of settlers that can be interested and the sooner the project can be settled up. Surely, therefore, settlement is a major feature and the factors that enter into it must be given careful attention from the time the project is started.

From the long experience of Dr. Elwood Mead, Commissioner of Reclamation, and the results accomplished by the Bureau of Reclamation during the 25 years of its existence, a plan for the development and settlement of irrigation projects has been adopted and is being worked out which covers every feature from the preliminary investigation to the survey of the farm units and the securing of settlers.

A plan has also been worked out for handling the settlement problems that have been encountered on a number of the older projects on which construction has been completed, and is working out very satisfactorily. During the past year a large number of settlers have been secured for these projects, with gratifying results both from the standpoint of the progress of the individual settler and the progress of the project.

Some of our older projects that were in very poor condition economically a few years ago, mainly on account of the lack of a practical and businesslike settlement plan, are now going ahead at a rate that will put them in the class of well-founded going concerns in a few years.

### THE KITTITAS DEVELOPMENT

The plan for the development of new projects is now being carried out in the development of the Kittitas division of the Yakima project and several other new projects, and is also working out satisfactorily.

A brief description of the Kittitas division, and a summary of the results accomplished, may be interesting.

The Kittitas division of the Yakima project includes an irrigable area of 72,000 acres located in the vicinity of Ellensburg, Washington, and is estimated to cost \$9,000,000. The work of the bureau on the division to date covers the following features:

1. Investigation to determine feasibility, and estimates of cost.

2. Soil survey and classification of land by experts detailed to the work by the United States Department of Agriculture.

3. Investigation of economic conditions.

From the results shown in the reports made in connection with these three investigations, the project was found feasible.

A contract has been entered into with the Kittitas reclamation district providing for the construction of a canal system to convey water to the land. In addition to other important details, the contract contains provisions intended to limit speculation, and providing for the appraisal of the agricultural value of the land and the application of one-half of the difference between the appraised value and the sale price, if any, to the construction and operation and maintenance charges. This appraisal has been made with the following results:

The following schedule of land values was adopted after a careful study of all conditions:

- (a) Lands improved and productive without irrigation, \$30 to \$70 per acre.

- (b) Lands improved but nonproductive without irrigation, \$10 to \$30 per acre.

- (c) Sage brush land in native condition:

	Per acre
Class 1-----	\$8. 00
Class 2-----	5. 50
Class 3-----	3. 50
Class 5-----	3. 50-15. 00
Class 6-----	1. 00-3. 50

- (d) Timber land: \$1 to \$3.50 per acre, with value of timber not considered.

The results of the land classification without deducting for canal rights of way are as follows:

Productive land:	Acres
Class 1-----	19, 852. 64
Class 2-----	36, 857. 11
Class 3-----	13, 299. 04
	70, 008. 79

Nonproductive land:

Class 5----	1, 102. 31
Class 6----	28, 039. 40
	29, 141. 71
Total-----	99, 150. 50

The results of the appraisal show the value of project lands and improvements to be as follows:

Total value of lands----- \$1, 008, 569  
Total value of improvements. 940, 757

Total value of real estate----- 1, 949, 326

It is thought the valuations given eliminate the possibility of speculation in project lands, are fair to the present owner, and should insure the prospective settler against the failure which might occur from a too large initial capital investment in land. It is believed new settlers with even a fair chance to make good can pay these appraised prices, or considerably more, and succeed, as the more he pays for his land the less the water charges are.

### PREVENTING SPECULATION

Paragraph 24 of the contract covers this provision and reads as follows:

(a) No part of the water supply provided through the irrigation works constructed under the provisions of this contract shall be delivered to or for any lands except the lands of the district whose owners, for themselves, their heirs, successors and assigns, have executed and delivered recordable contracts in a form to be approved by the Secretary, accepting the terms and conditions of this contract, and agreeing that their lands shall be bound by all the terms and conditions of this contract, and particularly the terms set out in this article; and the United States may reduce the amount of water provided to be delivered to the district to the extent of the water supply which would have been furnished to or for any lands not subscribed to such recordable contracts had they been subscribed.

(b) The value of the irrigable lands within the district boundaries shall be determined by a board of appraisers consisting of three members, one to be appointed by the Secretary, one by the district, and the two to select a third member. The board shall be appointed upon execution of this contract and shall at once make an appraisal of all district lands. In appraising said lands no speculative value shall be given thereto on account of the prospect or possibility of securing water through the said works proposed to be constructed by the United States, or on account of any claimed water supply from other source, but the same shall be appraised on the basis of such value as they would have without such prospect of water from said proposed works and without any supply from any other source.

(c) The United States shall not be obliged to make any expenditures under this contract until the appraisal above provided for is approved by the Secretary.

(d) The cost of said appraisal shall be paid for by the United States as part of the construction charge provided for herein.



(e) The owner or owners of the lands which after such appraisal are improved by the construction of buildings, fences, or other structures, or by leveling, ditching, clearing, or the seeding of grass, clover or alfalfa, or the planting of trees, or by the making of other improvements, may have such improvements or betterments so placed upon said lands after said appraisal, appraised by a board of appraisers selected in the same manner provided above, upon payment to the district of the estimated cost of making such appraisal of improvements, and thereupon such appraised value of such improvements shall be added to the appraised value of the land previously made, it being understood and agreed that improvements on the land at the time of the original appraisal will be included in the original appraised valuation of the land.

(f) Upon the sale of any land within the district, the vendor and vendee shall file with the secretary of the district a statement, executed by both under oath, describing the land and showing the amount of the purchase price of said land and giving the details of said transaction, and after any sale, transfer or trade of such land no water shall be furnished therefor until such statement, under oath, has been filed and the payment herein provided for made to the district to apply on the water right of said tract of land. It is understood and agreed that such land shall not be traded or transferred for other than a money consideration, nor upon an instalment contract, unless a sufficient cash payment be made to cover the payment to be made to the district as herein provided, and that any such trade or transfer for other than a money consideration, or without a sufficient cash payment to pay the amount provided herein to be paid to the district, shall immediately suspend the right of such tract of land to receive water from the works constructed by the United States until such land shall be reconveyed to the former owner or sold for a money consideration to another vendee and payment made to the district as herein provided.

(g) This contract shall be recorded in the office of the county recorder of Kittitas County and shall be notice to all landowners of the district and all future purchasers of land in the district that the right to receive water from any irrigation works constructed by the United States is conditional upon compliance with the terms and conditions herein set out.

(h) The appraised value of the land under the appraisal provided for above shall be considered a fair selling price, and if any of the lands of the district are sold at a price in excess of such appraised value, plus the appraised value of improvements and betterments hereafter placed on said land, plus the construction payment made to the United States on the cost of the water right for such tract of land (as a condition precedent to the transfer of title or the execution of a valid contract of sale), the vendor shall pay to the district, or the vendee shall pay to the district out of money which would otherwise have been payable to the vendor, an amount equal to 50 per cent of such excess.

(i) Such payment shall be credited on the books of the district to such tract of land so transferred as an advance payment of future construction and operation and maintenance charges in the following manner:

First. On any construction charges or assessments coming due during the first year after said payment.

Second. On any operation and maintenance charge over \$1 per acre coming due the first year after said payment.

Third. Then, if any money remains, on the construction charge, and then on the operation and maintenance charge in excess of \$1 per acre coming due the second year following said payment; then in the same manner upon the construction charges and operation and maintenance charges in excess of \$1 per acre for subsequent years as long as the credit lasts.

(j) In the case of any additional sale at a price in excess of the price paid at a previous sale, in connection with which previous sale the amount provided for herein has been paid, to the district, the showing by statement under oath, the conditions and the penalties for failure to make such showing and payment and the procedure in connection therewith shall be the same as provided above with reference to the first sale, except in the case of such second, third, or additional sale at an increased price over and above the price at the first sale the amount to be paid to the district shall be 50 per cent of the excess of such last sale over the price at the preceding sale, plus the appraised value of improvements and betterments, provided the preceding sale was one at a price in excess of the original appraised value, plus improvements and betterments, and one on which the 50 per cent payment herein provided shall have been already made.

(k) The provisions of this article shall apply to any and all transfers and contracts for the transfer of lands in the district until all construction charges due the United States shall have been paid.

(l) The amounts so collected or received by the district on account of such sales of district lands, at prices in excess of the appraised value, plus the appraised value of improvements and betterments, shall be kept in a special deposit, secured by bond, and shall be promptly applied to the payment of construction charges as provided in this paragraph as the same come due from time to time.

(m) Adjudication of invalidity of Article 24 of this contract, or any part of said article, shall not impair or otherwise affect the validity of any other of the articles hereof.

(n) Leases and crop share contracts of lands in the district with option to purchase or other provision for transfer of title to the lessee or crop share tenant will be treated as agreements to sell, and the rental payments or crop share payments provided therein will be considered part of the purchase price.

(o) The district will keep track of transfers of land and agreements to sell by monthly inspection of the county records or abstractor's records or other suitable means of securing such information, and when transfers or agreements to sell or convey appear of record or otherwise come to the attention of the district officers, they shall discontinue or refuse to begin delivery of water to such land until the conditions of this contract have been complied with by the filing of the affidavits provided for herein and the making of the required payment to the district if payment is required under the terms of this contract.

(p) Rules and regulations for the purpose of carrying out and enforcing the provisions of this contract may be adopted by the Secretary, and the district will

comply with such rules and regulations and will, for the purpose of carrying out the provisions of this contract, adopt rules and regulations of its own not in conflict with those established by the Secretary, and it is agreed and understood that such rules and regulations may include rules and regulations making the following requirements designated as subdivision (q) of this article, or any part thereof, to wit:

(q) That each year, prior to the delivery of water to any tract of land in the district for which water service is desired, the district shall require from the owner thereof or the duly authorized agent or representative of the owner, a card or other form of application for water service containing an affidavit setting out what if any sales, transfers, or agreements for the sale or transfer of the land described therein have occurred since the last application for water service on said land was filed, or, in case of no previous application having been filed since the appraisal thereof provided for herein was made, and the district will furnish to the Secretary, either copies of such applications and affidavits or a statement of the information contained therein, together with a reference to any transfers or agreements to transfer district land which are not reported in such applications but which have come to the attention of the district officers through inspection of the county records or otherwise and a list of the lands delinquent more than one year in the payment of any assessment, such information to be furnished the Secretary for his guidance in determining the amount of water to be delivered to the district by the United States. No land in the district shall be entitled to receive water any year until such application and affidavit has been filed with the district.

A contract was entered into with the State of Washington whereby the State agreed to assume the duty and responsibility of the development and settlement of the Kittitas division after the completion of the canal system, which provides funds necessary for the purpose to the amount of \$300,000. Details will be worked out for carrying the terms of the contract into effect by the time the construction of the canal system is completed.

#### SELECTION OF SETTLERS

There is considerable public land on this division, and the selection of settlers for these lands will be handled as provided for in the act of December 5, 1924, subsection C of which reads as follows:

That the Secretary is hereby authorized, under regulations to be promulgated by him, to require of each applicant, including preference-right ex-service men, for entry to public lands on a project, such qualifications as to industry, experience, character, and capital as in his opinion are necessary to give reasonable assurance of success by the prospective settler. The Secretary is authorized to appoint boards in part composed of private citizens, to assist in determining such qualifications.

The regulations carrying out the terms of this part of the law provide that no entry for public lands within a Federal irrigation project will be accepted by the

(Continued on page 181)

## The Washington State Fair—Yakima, Wash., 1927

By A. E. LAWSON, Secretary-Manager



Horticultural Building (right); New Dairy Exhibits Building (left)

**A**LL records were broken at the thirty-first annual Washington State Fair held in Yakima, September 12 to 17, 1927. An attendance of approximately 90,000 excelled by far all previous records. The direct receipts which amounted to approximately \$70,000 are more than \$10,000 greater than any receipts for previous years, leaving a balance on hand of approximately \$28,000 for staging a 1928 fair.

Greater in importance than the attendance and the cash receipts are the educational benefits derived from a fair and there is no doubt that this year's fair presented in its exhibits in all of the

departments, displays that were of State-wide importance.

It might be said that a new State fair was presented to the people of the State this year. An appropriation of \$40,000 for permanent improvements was made by the State legislature in the 1927 session and the expenditure of this money in new buildings and landscape improvements changed the entire appearance of the fairgrounds and added a large amount of exhibit space that was badly needed. From this appropriation was built a new woman's building in which are housed all of the exhibits of domestic and fine arts with space for demonstration of all kinds

of work done by women, particularly that which is connected with home activity. This new woman's building of Greek temple beauty occupies a commanding position on the beautiful lawn quadrangle and gives a distinction to the entire fairgrounds.

In addition a dairy products building was constructed. This building was constructed with the idea of lending assistance to the dairy industry which has grown to such importance in the State but which needs far greater development in the State and particularly in the Yakima Valley. It is constructed entirely of brick and is both fireproof and sanitary. In one section of this building was installed a complete butter-making plant and butter was made daily during the fair. We were particularly pleased with the results obtained in this demonstration. Crowds of people watched the operation daily of this plant and it was found that perhaps not over 10 per cent of the people knew how butter was made in a modern dairy plant. The remainder of this building was used for exhibits of miscellaneous dairy products sent to the fair from creameries, cheese factories, and individuals all over the Northwest. There were also commercial displays of dairy products and dairy equipment.

Our third building constructed was a new poultry exhibit building 96 by 150 feet. This building replaced the old poultry house and had twice the floor space which was well filled this year.

The above three buildings were the main items of the construction program,

### Development and Settlement of Reclaimed Land

(Continued from page 180)

land office until the applicant has satisfied an examining board that he possesses the necessary qualifications of industry, experience, character, and capital.

The applicant must possess good health and vigor, must have had at least two years' actual experience in farm work and farm practice, and must have at least \$2,000 in money, free of liability, or its equivalent in livestock, farming equipment, or assets as useful as money, with some reduction possible in the amount of money and experience required when the farm unit applied for is 10 acres or less.

By means of this selection, an effort is being made to do justice to both the settler and the investment in the project. The failure of a settler to make good is

more serious to him than is the delay in the repayment of the cost of the works to the United States, so if the board decides that an applicant has no chance to succeed, they are doing him a kindness in not allowing him to go on a piece of land.

The bureau is now engaged in the construction of a canal system for this division, estimated to cost \$9,000,000, and several years will be required to complete the work.

As the construction of the Kittitas division proceeds, additional details will be worked out for handling settlement and farm development, to the end that all important problems may be given the attention necessary to make the venture a complete success.

but in addition to construction, money was spent on new lawns, flower beds and shrubbery, and almost all of the old buildings on the fairgrounds were given a new coat of white paint.

Every department of the fair showed an increase in the number of exhibits entered. "The greatest display of livestock ever shown at the Washington State Fair," was the declaration made by many of the exhibitors. It overflowed the exhibit pens and stalls. The dairy show in particular has never been equaled. At this fair were 110 Holsteins, 80 Jerseys, 60 Ayrshires, 50 Guernseys, and 45 Brown Swiss. The showing of beef cattle was also of merit with Shorthorns leading with 70 animals shown. The draft horse show was particularly attractive with the largest representation in the Shire classes. The sheep show was up to normal with a very good representation from the boys' and girls' club members. The swine show was larger than it has ever been for several years but not nearly so large as it should be. Swine production, along with dairy production, needs more expansion in this State, and particularly in the Yakima Valley.

The agricultural and horticultural show and county exhibit competition perhaps shows best the representative character of the fair besides adding real educational value. There were 20 county exhibits on display this year besides Yakima County, which had a beautiful display of apples which were particularly representative of this county. This showing of county exhibits was pleasing because it speaks of a State wide interest and support of the fair. It is interesting to state that in 1923 seven counties were represented. No fair was held in 1924 and in 1925 13 counties exhibited; in 1926, 16 were represented, and this year 21 exhibited. Chelan County was awarded the sweepstakes prize as well as first among central Washington counties. Spokane County was first in the eastern division and Cowitz County in the western division.

The number of exhibits and size of the show can be easily seen by the fact that 25 per cent more premium money was paid out this year than in any former year.

**T**HE State Bureau of Highways of Idaho is arranging to start construction on a new bridge across Snake River between Burley and Heyburn, Minidoka project.

**M**ORE than 44,000 turkeys will be marketed from the Newlands project this fall.



New Woman's Building, Washington State Fair

## *Agricultural Development And Irrigation Construction*

**D**AVID WEEKS, associate in agricultural economics, and Charles H. West, assistant agricultural economist, in cooperation with the Federal Land Bank of Berkeley, have prepared as Bulletin 435 of the University of California, a comprehensive discussion of the problem of securing closer relationship between agricultural development and irrigation construction, which supplements and illuminates a similar study of this problem made by the Bureau of Reclamation during the past two or three years.

The key-note of the discussion is found in what is now recognized by leading irrigation economists as an almost axiomatic statement that "irrigated agriculture in the last analysis is an economic problem." Quoting from the bulletin—

"The coordination of agricultural and irrigation development is difficult. Once a project is begun, prompt settlement is necessary. The problem is one, then, of constructing only projects which are feasible when all of the elements of cost are considered, and of developing a plan of land settlement whereby prompt utilization of irrigation construction will take place.

"The feasibility of the project can be determined only by careful engineering and economic analyses. A large element

in the success of the projects is the accuracy with which the time required for settlement can be gauged and estimates of the cost of delay computed. Costs incident to the purchase of raw lands and the construction of irrigation works are no more important than costs incident to holding undeveloped land after construction, and to the improving and equipping of farms. Feasibility surveys must include careful soil surveys to determine the productive capacity of the land. The project is not feasible unless the soils produce enough to make farming profitable after project operation and maintenance and interest on the construction cost are deducted. In making estimates of costs and of income, changing prices of materials used in construction and of products sold by the farmer must be given careful attention. Projects must be studied with reference to trends of production of crops adapted to them and with reference to business conditions. In addition to determining the feasibility of irrigation projects and working out a sound land-settlement policy, consideration should be given to the timing of irrigation development more nearly in accord with the demand for land by prospective settlers.

"An economic analysis is just as difficult as the design of irrigation structures and just as important. Engineering reports should be supplemented by economic reports. The importance of economic studies in connection with feasibility studies is now generally recognized, but we are still greatly handicapped by the want of basis economic data. Years of research in the engineering field place at the command of the engineer a large amount of information which forms the basis of more or less exact determinations. Economic estimates are of necessity too general.

"The difficulty in the past has been that although the importance of the factors of feasibility has been realized, the relative importance of the various items has not been measured. The development of a basis for applying a means of measurement of these factors to feasibility investigations will mark a new era in scientific analysis of project feasibility."



Belle Fourche Project Turkeys About Ready to Market

## Meat and Refrigeration Service on the Newlands Project, Nevada

By A. W. Walker, Project Superintendent

**T**HE problem of keeping fresh meats during the hot summer months in an agricultural community is considerable. Most of the farmers on our irrigation projects can successfully grow the meats, but few of them are equipped to keep it fresh any length of time during the hot weather. The question has generally resolved itself either into going without fresh meat most of the time or securing limited quantities from the butcher shop and paying prices accordingly.

On the Newlands project this vexing problem has at least been partly solved by the enterprising spirit of the Fallon Ice & Cold Storage Co., which is located at Fallon, Nev., near the center of the project.

A portion of their refrigerating room has been set aside for the benefit of their farmer patrons and run on the principle of a safety-deposit vault in a bank.

The room at present is 18 feet long by 12 feet wide and 12 feet high. There are now 45 box compartments in this room, each 2 by 2 by 3 feet wide, or 12 cubic feet capacity. The walls and doors of the compartment boxes are open lattice work. Each compartment can be locked and will hold approximately 400 pounds of meat. The meat is cut into pieces that meet the consumers' requirements before placing in the boxes. This saves time and trouble in getting the meat out of

storage, as frozen meat is difficult to cut. The temperature of the room is kept between 24° and 28° F., which freezes the meat so that it will keep indefinitely.

The moisture content of the air is controlled by calcium chloride being placed in open vessels. Occasionally the room temperature will rise above 32° F. for a short period and mold will start to grow on the meat if there is sufficient moisture

in the air. Tainting of the meat will follow if the mold is allowed to grow unrestricted.

The building is constructed of concrete blocks and insulated with 6 inches of sheet cork. The direct expansion (of ammonia) method is used in lowering the temperatures of the room.

The charges for a box in the cold storage room are \$2 per month or \$7 for the season of five months. A patron simply calls at the office and makes known his wish to get into his rented cold storage box and an attendant goes with him and lets him into the main room.

The primary reason why the room was established was creation of new business for the refrigerating plant and company. Each patron when he takes home a piece of meat will also buy ice, and other items handled by the company, to keep the meat at home for a few days. The revenue from the room pays interest on the investment and creates good will, for the farmers surely appreciate the service.

The company handles ice, fuel oil, wholesale candy, bottled goods, like soda water and light beers, and is contemplating a wood and coal yard. They have cold-storage space of all kinds, amounting to 8,000 cubic feet. They store vegetables, hams, bacon, candy, etc., in a room with a regulated temperature from 32° to 40° F. for 1½ cents per pound for the season.

## This Water User is Glad to Pay Bills

*The ERA is glad to make special mention of a water user on one of the Federal irrigation projects. Replying to a recent questionnaire, this water user states that all charges due on construction and operation and maintenance on his farm have been fully paid. His questionnaire concludes with the following statement:*

*"Any farmer can make money here who doesn't overcrop and is willing to work. What we need here is more real farmers. I have made some money here every year, having lived here nine years; and it is a pleasure for me to pay my bills as they come due."*

*We would be glad to hear from other water users in a similar strain.*

**T**HE new beef feeding yards at Belle Fourche are using 135 tons of beet pulp a day feeding 1,500 head of steers.





## Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era



### Old Art Revived: Rug Making

THE illustration shows a home demonstration agent teaching a group of women how to make various kinds of rugs. The meeting is being held in the women's club building of Quincy, Fla. Both braided and woven rag rugs interest a good many of the club members, and the making of hooked rugs is a revival of an old art that has become very popular all over the country. Through home industries of this kind, many rural women are beautifying their homes or increasing their cash income, and are being enabled as a result, to get for themselves many household conveniences and labor saving devices.

Artistic designs and patterns in beautiful color combinations are being standardized in this rug-making industry by groups of women who are working together in community or even county-wide organizations, known as county weavers' associations. Thousands of dollars have been cleared in one year's time by such groups of women working together in a single county as a single unit. Commodity organizations have followed successful production and standardization work in rug making in a similar manner to what has been done in the cooperative marketing of other farm home products.

### Spare Your Patience

Better ways to do things, thus saving time and your patience, are always worth the space it takes to pass them on.

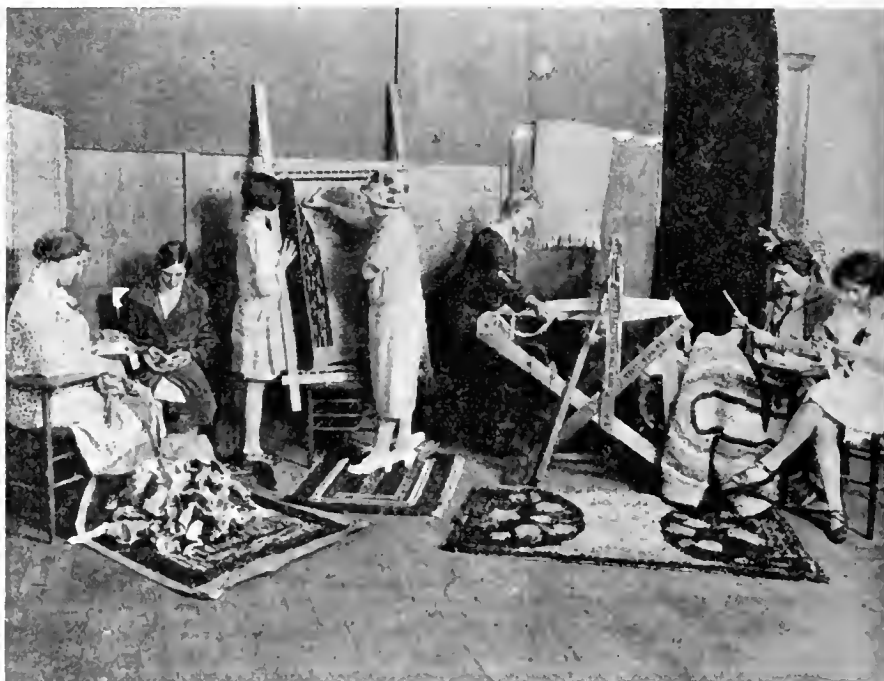
Have you ever been in a hurry and tried to open a flour, sugar, or salt sack? If you have you know that you always pull the wrong thread of the chain stitch.

Here is a way that never fails:

Lay, face up the side with the single stitching, begin at your right hand end of the seam and it will unravel by loosening the lock stitch.

### Satisfied—Contented

When a woman over 50 years of age can go on a new project, endure all the hardships of pioneering and come up smiling, with a story of perfect contentment with what has been accomplished in the time, and with the means at her disposal, it is



Teaching Rug Making at Woman's Club Building

truly an account to be repeated in this section, which is read by thousands each month, in all sections of the United States, as our correspondence and mailing list indicate.

The following story received from a housewife on the Minidoka project is printed without giving the name of the author; this at her special request.

Coming to Idaho in 1911 after living in the rain belt of the North, East, and South, until about 50 years of age, I believe I can safely make comparisons between the conditions existing on the farms there and here.

We came to the Minidoka project when it was new and have experienced some of its hardships, not the least of which were the poor houses and lack of farm and road improvements. My first ride over the frozen, rutted roads was like jolting over cobblestones. The little shacks reminded me of inverted baking powder cans.

Since coming here we have made several trips back to our former home and found conditions little better than when we left. The kerosene lamp was the only lighting system in most country homes. We have outgrown that stage and now light our

homes with electricity. We also have the iron and many other electrical appliances which lighten household tasks. These appliances range from toasters to incubators to hatch our chickens.

Most women will be interested in the social life of this "Empire of the West." With electricity to help us, we have much more time to spend socially and in self-improvement. There are clubs of different kinds—some for pleasure and amusement, others of real aid to the community. Women's vacation camps in connection with the extension department of the University of Idaho keep us informed in the newest methods in home making. Such gatherings are well attended, and they are recreational, educational, and inspirational.

Our schools are of the best. Standards for teachers are being continually raised. Books are furnished to pupils by the district, and in some places auto busses bring the children to and from school.

In 1910 sagebrush covered a large part of the Minidoka project and, in a way, proved a blessing as a fuel when settlers were too poor to buy coal. It littered the floor and vexed the housewife. Some one





Home of H. C. Stetson, Superintendent, North Platte Project, Mitchell, Nebr.

called it a "three-man wood"—one to cut it, one to feed the stove, and one to cook with it. This brush was removed from the land, high places leveled, ditches made, and farming began in earnest. The new ditches often broke and flooded the wrong field. After some time and experience, these things were corrected.

The soil is the most productive I have ever seen. According to a soil expert, this fertility is due to potash which would cost \$1,000 per acre if applied artificially. We can stop a drought at any time. Each crop can receive its water when needed and have it turned off when not needed. Because of little rainfall between April and the fall months, crops can be harvested without loss. The schedule of work can very nearly be prepared in the spring and followed through the entire season.

There are many ways for the housewife to raise pin money, but I have never found anything better than a flock of well-fed hens. It's a bank account and you need have no fear of overdrawing. Another source of income is our dairy. The butter is unexcelled in quality and recently discovered to be unusually rich in vitamins.

Where it was once barren, bright flowers relieve the monotony of the sagebrush plains. The green of alfalfa and the gold of grain fields against a background of snow-capped mountains make a picture never to be forgotten.

After years of work and worry that go with making a home on a new irrigation

project there comes contentment as a reward of well-directed labor.

The following poem was inspired and written at the time of the visit of the wife of Congressman Winter, of Wyoming, to the proposed Columbia Basin project in Washington.

## Lake Pend Oreille

Amid the mountains' frosty peaks,  
From out the streams of ice and snow  
Through sultry summers and winters bleak  
I was born perfect, ages ago.

When just a babe in the valley below,  
Baptized with raindrops, glistening pure,  
Learning then from the rays of my father, to know  
That my mission in life was to feed, heal, and cure.

My mother, the Earth, in whose arms I was placed  
The day I was christened Lake Pend Oreille,  
Whispered wise words of problems I faced,  
Then told me of love, and my fiancée.

My childhood was happy, with playmates galore,  
The fast-flowing streams, the stubborn old rocks,  
The frolicking wild deer, the lions that roar,  
The pine cones, the flowers, the birds in vast flocks.

Yes, I have been giddy and fickle and vain,  
I have flirted with rainbows, clouds, and moonbeams.  
I have hidden my eyes behind fans of white rain,  
I have vamped and been courted by men of great fame.

First came the red man with feathers, and paint,  
War whoops, canoes, flint fires on my banks;  
He took food from my breast, and called me a saint,  
He caressed me, he thrilled me, then left without thanks.

Then came the whites with blood of the French,  
They had eyes for my charm and beauty and grace;  
They fell to their knees in great reverence  
And with passionate lips they kissed my cool face.

And down through the years I have heard my mate call  
I've been dormant too long, I am ready to wed;  
He's steadfast and true, he's handsome and tall,  
He wants me, he's waiting, oh, how he's plead.

I have promised to go real soon,  
Down where the rivers meet,  
Where the red-blooded men of this nation  
Will place me, there at his feet.

After our marriage which takes place in May,  
Columbia, my dream child you'll see  
Green meadows, fine homes, happy children at play—  
A great western empire he'll be.

—ALICE MALTBY WINTER, Casper, Wyo.



Acres of Cabbages on the Rio Grande Project, N. Mex.-Tex.

## British Settlements in Canada Under the 3,000 Families Scheme

*Extracts from a report by the Right Hon. the Earl of Clarendon, chairman, and Mr. T. C. Macnaghten, vice chairman, of the Oversea Settlement Committee, November, 1926*

“UNDER the terms of an agreement entered into between His Majesty's Government and the Dominion Government in August, 1924, the latter government agrees to provide suitable families from the United Kingdom, who are recruited and selected by representatives of the Dominion Government, with suitable farms in established districts throughout Canada. The farms must contain a sufficient amount of land fit for immediate cultivation, and a house must be provided upon each of them.

“The total indebtedness which may be assumed by any family must not exceed \$7,500 and varies from a minimum of \$3,500 up to this maximum. The debt incurred for the land, house, and farm buildings, which must not exceed \$6,000, is repayable to the Dominion Government, and the debt for livestock and equipment, which must not exceed \$1,500, is repayable to His Majesty's Government. These debts are repayable with interest not exceeding 5 per cent in 25 equal annual payments. The annual repayment in the case of a family whose debt is \$3,500 would be approximately \$250 a year, and about \$525 in the case of a family whose debt is \$7,500. Under the terms of the agreement the first repayment falls due at the end of the second season after the family's arrival in Canada, but in the case of farms from which no immediate large revenue may be expected, the first repayment is usually deferred until the end of the third season after arrival.

“Under the Dominion Government at Ottawa, the scheme is supervised by the land settlement branch of the department of immigration and colonization of which the soldier settlement board (i. e., the organization set up to deal with the settlement of Canadian soldiers upon the land) has recently been made a part. The staff of the board, throughout the Dominion, which actually handled the various stages of soldier settlement, is now used to handle the settlement of the British families. The head office of the board is at Ottawa, but with a view to decentralizing administration the Dominion is divided into 11 districts.

“Each of the 11 districts is divided into subdistricts, of which there are about 120 in the whole of the Dominion. In charge of each subdistrict is a field supervisor. This officer maintains no office of his own. He usually lives in a small town in his subdistrict, is provided by the Government with a motor car, and spent his time touring in his subdistrict and advising

and assisting soldier settlers in all possible ways. He made the arrangements for their entry upon their farms, and advised them as to the purchase of their livestock and equipment, and as to all their agricultural operations. The settlement of Canadian soldiers is now virtually complete and the work of supervising them at the beginning of their farm life is diminishing. Therefore the field supervisor is now able to devote part of his time to the settlement of British families.

### HANDLING THE BRITISH FAMILIES

“The farms upon which British families have been placed are owned by the Dominion Government. Most of them have been occupied by Canadian soldiers at some time or other since the war, but have reverted to the Government, in some cases owing to the death of the occupants, in others owing to their having abandoned farming for other callings, or having failed to adapt themselves to farm life. More than 30,000 Canadian soldiers have been placed upon farms by the soldier settlement board, and it is natural that in course of time a certain percentage of the farms should have fallen vacant and reverted to the Government. Some of the vacant farms are considered unsuitable for the settlement of British families and those which are being used have been carefully selected. In every case they have been revalued and the price put upon them by the land settlement branch has been reviewed by independent advisory committees. In many cases the prices charged are substantially, perhaps 10 per cent, lower than those obtainable in the open market.

“When the families reach the railway point nearest to the farm to which they are proceeding, they are met by the field supervisor, or, in cases where several families are arriving at different points on the same day, by a local resident whom he has deputed to act on his behalf. From this time onward through every phase of their settlement, while learning to farm and working for wages, when taking over their own farms, and subsequently when buying equipment, plowing, planting, seeding, harvesting, and marketing, the British families are looked after by the field supervisor until they are fully established and capable of managing their own farms.

“After the families have arrived and been located on a farm, the district offices are authorized to purchase on their behalf their immediate requirements in

stock and equipment; that is, one or two cows, a pig, and some poultry. A cheap horse and buggy are often bought, where the husband is being found employment at some distance, or where the school is at a greater distance than the children can walk. All these are purchased by the field supervisor, who usually takes the head of the family with him to inspect the purchases, the cost of which is debited to the loan made by His Majesty's Government.

“The amount expended on these initial stock purchases seldom exceeds \$200. Only in special circumstances do the Dominion authorities agree to the payment to any family of a substantial portion of the balance of the loan, which may not exceed an average of \$1,500 per family, made by His Majesty's Government for stock and equipment, etc. Usually the expenditure of the balance is not sanctioned until the family has successfully completed the probationary period, in most cases from six months to one year, has been finally accepted by the Dominion authorities for settlement under the scheme, and has been installed upon the farm which it is to occupy and cultivate. Consequently the risk of loss of any substantial portion of the advances made by His Majesty's Government is very small.

“At the end of the probationary period of a year or less the families are allowed to buy the balance of their stock and equipment; that is, in most cases a team of four horses, additional cows up to the capacity of the farm, farm machinery, etc. All this additional livestock and machinery is bought out of the advances made by His Majesty's Government, under the supervision of the field supervisor, who goes with the head of the family and helps him to make the purchases.

“The essential difference between the handling of the Canadian soldier settler and the British settler under the three thousand families scheme is that the former has been allowed considerable discretion in choosing his farm and buying livestock and farm machinery, while the latter's farm is most often chosen for him, and the field supervisor guides him so far as need be in the purchase of stock and equipment.

### THE SCHEME IN OPERATION

“The scheme has thus far proved a conspicuous success and promises to become the most successful effort in colonization undertaken by any government in

modern times. The total number of families at present settled under the scheme is 1,504, comprising 8,381 souls.

"The percentage of complete failures is very small indeed. A few families have abandoned the scheme, some of these returning to the old country. Others have abandoned the scheme temporarily and intend to return to it. Possibly some 2 per cent have found work in towns. Those who have abandoned the scheme, whether temporarily or otherwise, hardly exceed 5 per cent of the whole. Of those that remain, some 10 per cent appear to be below the general average, and consequently we must regard their success as doubtful. We believe, however, that between 80 and 90 per cent of the families settled under the scheme will, given reasonably favorable conditions of climate and markets, make good and remain permanently settled upon the land as farmers. In saying this we do not overlook the fact that the scheme came into operation in the season of 1925, and that only those who came out in the season of 1925, namely, 454 families, have been a full year in Canada. The scheme must be tested for some time longer before it will be possible to speak with complete assurance in regard to the percentage of successes and failures. The total liabilities undertaken by the families, which may not exceed \$7,500, and probably average about \$4,000 to \$5,000, are large, and there would, in our opinion, be distinct advantage to future settlers if the liabilities under any new scheme could be made somewhat smaller."

## *Yakima's \$1,000 One-Ton Apple Pie Advertises Project*

**A**S an advertisement for national apple week and the Yakima project, Washington, the world's largest apple pie was successfully baked recently, and incidentally disposed of in an equally successful manner. The mammoth pie is shown in the illustration on the inside front cover page of this issue. Quoting from the Yakima newspapers—

"With all the world looking on through the eyes of motion-picture cameras, 1 barrel of flour, 100 pounds of sugar,  $2\frac{1}{2}$  pounds of cinnamon, and 400 gallons of apples were transformed into the largest pie ever baked. This pie, which weighed slightly more than a ton and cost \$1,000, would be exactly the right size to go on the table of a giant 1,000 feet tall and weighing 150,000 pounds. The dough was rolled into shape with a rolling pin 6 feet long, 10 inches in diameter, and weighing 50 pounds. Nine girls were

necessary to handle the rolling pin. In order to handle the dough for the crust it was cut into strips and laid into the monster pie pan, specially made for the occasion, a strip at a time. When the bottom dough was in place several barrels of cooked apples were dumped into the pan while girls with new garden rakes worked the material to a level. When the top crust was in place 20 girls crimped the pastry around the edge of the pan.

"When ready for baking the brick door to the front of the oven was raised with a block and tackle, and a winch pulled the huge pie into the intensely heated compartment where it remained for nearly an hour. The pie was hauled out of the oven with a tractor, cut by a special knife with a blade 4 feet long, which was made for the occasion, and served on paper plates to the crowd."

## *Riparian Lands Subject to Levy of Taxes by District*

*By H. J. S. Deorles, District Counsel*

**I**N the case of *Parker v. El Paso County Water Improvement District No. 1* (297 S. W. 737), recently decided by the Supreme Court of Texas, the plaintiff sought to enjoin the district from obstructing the flow of water through the plaintiff's ditch and to remove a cloud from his title claimed to result from existence of liens upon his lands for charges assessed by the district.

The plaintiff was the owner of lands riparian to the Rio Grande and included within the irrigation district created under the statutes of Texas, which district had contracted with the United States under the Rio Grande project, New Mexico-Texas.

The supreme court, in affirming the decision of the court of civil appeals (260 S. W. 667), denying the injunction held that the plaintiff's contention that his land, because riparian, could not be included in the improvement district, was without merit.

In ruling on the plaintiff's claim that by using the open channel of the river to carry its impounded waters the defendant had permitted the water to mix and mingle with the natural flow so as to become a part of plaintiff's riparian water and subject to his use, the court held that the

defendant clearly had a right to so use the channel and that the plaintiff was only entitled to his proportion of the riparian water which is the water below the highest line of the normal flow of the river. But the court also found that this was insufficient for beneficial use for irrigation if divided between the riparian owners and that the plaintiff was entitled to all benefits accruing to lands in the district and as well subject to the levy of taxes for the support of the district.

The court said: "It is equally certain that the fact that the defendant in error might not desire his land placed in the district; that he might not desire to irrigate it at all, that he could irrigate it from a different source; or that it was riparian land, would not prevent its inclusion within the district within the process clause of the Federal Constitution."

## *Reclamation Fund Safe From Columbia Basin*

There seems to be a feeling, expressed more or less definitely in some of the northwestern newspapers, that if the Columbia Basin project is approved by Congress for construction it will stop the development of all other irrigation projects in Southern Idaho and Washington, the intimation being that the Columbia Basin project would absorb all the reclamation fund so that no help could be given to other projects.

Plans for financing the Columbia Basin project have not definitely been determined. This is a matter finally to be passed on by Congress. The reclamation fund has never been considered in this connection.

To provide for economical construction and the completion of the project in a reasonable period would require much more than the total yearly accretions to the reclamation fund. Those in the Northwest who are interested in its construction and have given the matter considerable thought recognize this and are looking for funds from other sources. Furthermore, the fund for the next 10 years will be wholly absorbed in the completion of old projects and in the construction of the new projects authorized by Congress.

# Orchard Mesa Pumping Plant, Grand Valley Project, Colorado

By C. M. Day, Mechanical Engineer, Denver Office

THE Orchard Mesa pumping plant on the Grand Valley project, Colo., is located about one-half mile from the town of Palisade, Colo., and is used for pumping water from the Colorado River to about 11,000 acres of land on Orchard Mesa, on the south side of the river and extending from Palisade to Grand Junction, a distance of about 16 miles. Two canals serve this land, a high canal requiring the water to be pumped against a static head of 125 feet and a low canal pumping to a head of 40 feet. The district has the right to divert 400 second-feet of water from the Colorado River and to pump 125 second-feet onto the Orchard Mesa lands, the balance of 275 second-feet to be used for power and returned to the river above the diversion dam of the Grand Valley irrigation district.

## ORIGINAL INSTALLATION

The plant was constructed originally by the Orchard Mesa irrigation district in 1909 and operation was started in 1910. The pumping units were of the type known as "direct-pumping units," by which the pumps are driven by hydraulic turbines. There were four horizontal units in the plant, two being designed for pumping 62.5 second-feet of water against a total pumping head of 130 feet and two for pumping 62.5 second-feet against a total pumping head of 40 feet. The net power head available for operating the turbines was 75 feet.

The turbines were of the horizontal closed-flume type having double-discharge runners and two taper-plate steel draft tubes, and were designed for operation under the following conditions:

**High-lift turbines.**—23-inch double-discharge runners to deliver 750 horsepower at 490 revolutions per minute and 75 feet effective head, using 110.6 second-feet of water for power, giving an efficiency of 80 per cent.

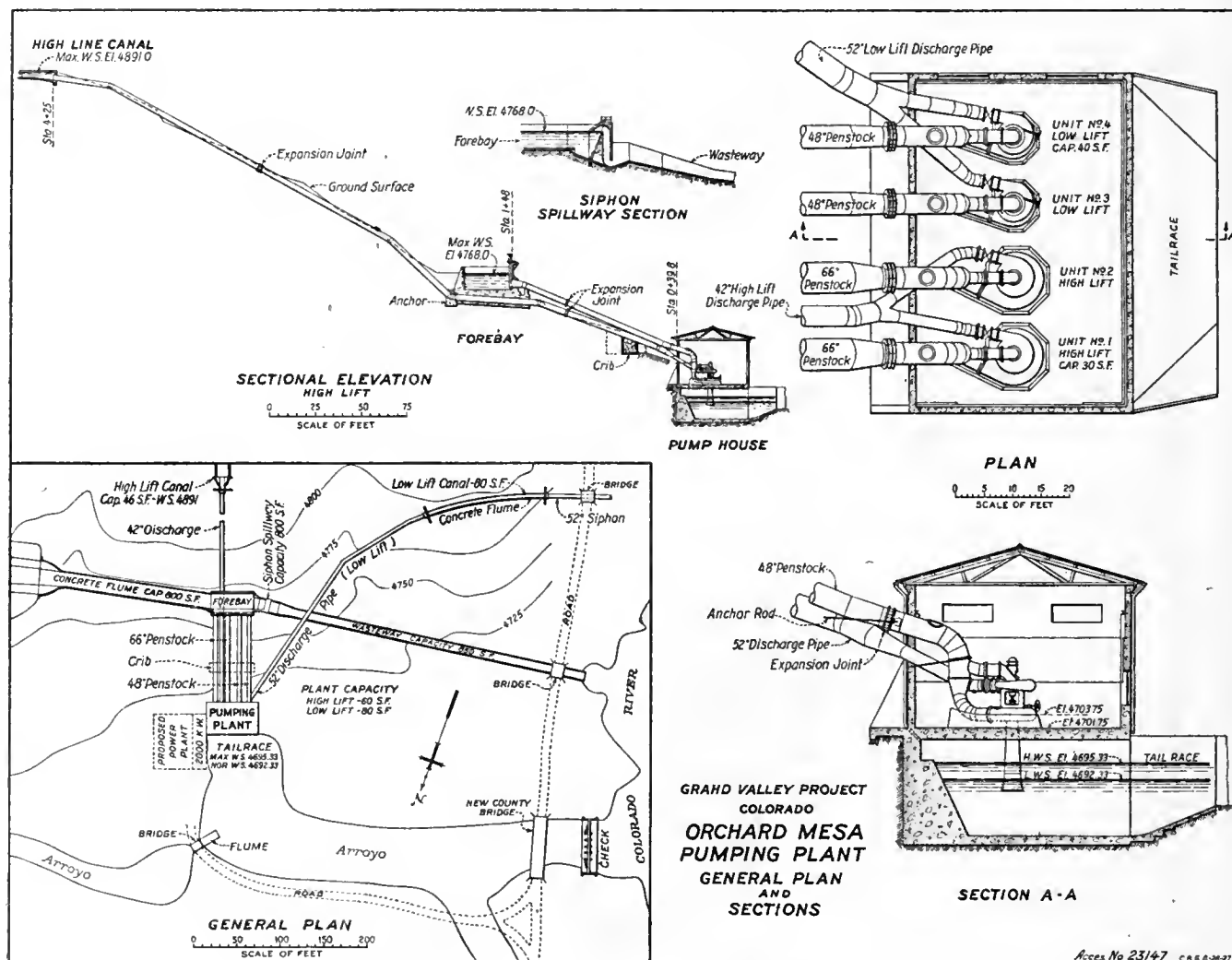
**Low-lift turbines.**—23-inch double-discharge runners to deliver 275 horsepower at 490 revolutions per minute and 75 feet effective head, using 40.44 second-feet of water for power, giving an efficiency of 80 per cent.

The pumps were designed for the following conditions:

**High lift.**—23.35 second-feet at 490 revolutions per minute and 130 feet total head, developing 63 per cent efficiency.

**Low lift.**—35.6 second-feet at 490 revolutions per minute and 40 feet total head.

The water for the plant was supplied through a canal with a designed capacity





of 525 second-feet and about  $8\frac{1}{2}$  miles long, being diverted from the Colorado by a brush and rock dam. The concrete fore bay was provided with a wasteway gate and timber chute with capacity to waste the entire canal flow into the Colorado River. The high-lift units were each supplied by a 66-inch plate-steel penstock, and the low-lift units by 48-inch penstocks, each penstock dividing at the plant to connect to the turbine and pump.

When water was first turned into the system, the whole hillside on which the fore bay and penstocks rest threatened to slip. A rock-fill crib was constructed between the plant and fore bay to serve as a retaining wall to guard against this slipping, also serving as a support for the penstocks. In 1922 an additional slip occurred, caused by a slight settlement of the fore bay structure. All four of the penstocks were affected by this slip, and when the concrete was chipped away where they connect with the fore bay the pipes sprang back uphill for about 1 inch. No. 1 high-lift pumping unit was lifted slightly and sprung out of alignment, and to bring it back to its original position one joint in the penstock was cut and reconstructed as a slip joint. The comparative performance of the original pumping units is shown in Table 1.

#### RECONSTRUCTION WORK BY THE UNITED STATES

In 1921 a contract was entered into between the Orchard Mesa irrigation district and the United States by which the United States would construct and reconstruct the works for the district. Under this contract the pumping machinery, fore bay, penstocks, and building were to be thoroughly overhauled, the wood-stave discharge pipes replaced with steel pipes, and the tailrace capacity increased and a new tailrace excavated for a flow of 800 second-feet. Of this flow of 800 second-feet, 400 second-feet are for the use of the district and the remaining 400 second-feet for future development of power by the United States.

An inspection of the pumping machinery in February, 1924, showed that the pumps were worn out and the turbines in little better shape. The pump cases for both high and low lift pumps were identical, and were fitted with stay bolts to withstand internal pressure. These stay bolts caused eddies resulting in cavitation to such an extent that in places the worn pockets extended nearly through the cases. This action is illustrated in the accompanying photograph. The low-lift pump cases were provided with filler rings on the inside to accommodate the smaller diameter impeller used for the lower head.

An estimate of the repairs required on the original turbines and penstock con-

nections and prices quoted for new pumps showed that the cost of overhauling the units would be extremely high and that if this were done the machinery would still be obsolete and inefficient. It was therefore decided to purchase new units of the vertical spiral turbine case type, designed especially for the two pumping conditions to be met.

In August, 1924, specifications were issued for four new vertical direct pumping units to operate under the following hydraulic conditions:

	High lift	Low lift
Maximum power head, net.....feet..	74	74
Minimum power head, net.....do....	71.5	71.5
Total pumping head, 1 pump running.....feet.....	126.5	39
Total pumping head, 2 pumps running.....feet.....	130	41
Size each penstock.....inches.....	66	48
Length each penstock.....feet.....	120	120
Size discharge pipe.....inches.....	42	52
Length discharge pipe.....feet.....	450	321
Capacity each pump.....second-feet....	30	40

The provision for extra capacity in the high lift units was made to give the plant a reasonable surplus to provide for a drop in capacity due to wear, and in case of a break-down of one of the low lift units, would permit pumping the surplus of 15 second-feet into the high line canal and dropping it into the low lift canal at any convenient place, to augment the output of one low lift pump until the other unit was repaired. The Worthington Pump and Machinery Corporation was low bidder, their price for the four units, exclusive of repair parts, being \$30,300, and the total shipping weight 110,200 pounds. The guaranteed performance of the units was as follows:

	High lift units		Low lift units	
	Capacity at 130-foot head	Overall efficiency of unit	Capacity at 4-foot head	Overall efficiency of unit
	Second-feet	Per cent	Second-feet	Per cent
	14	47.5	20	52
	18	56	25	60
	22	62.5	30	65.5
	26	67	35	69.5
	30	69	40	71
Speed with wicket gates and pump discharge valve wide open (revolutions per minute).....	525		505	
Speed with wicket gates wide open and pump discharge valve closed (revolutions per minute).....	670		515	
Weight of heaviest part, turbine casing (pounds).....	13,000		5,500	

The pumping units are all of the same type, being vertical centrifugal pumps direct-connected to vertical spiral scroll case turbines with Francis type runners.

The new discharge pipes are of riveted plate steel, the 52-inch low lift pipe being galvanized and dipped. The high lift pipe is of black steel and both pipes were dipped while hot in a hot bath of preservative coating at a temperature of 450° F.

The new high lift units were put into operation in April, 1925. (See New Reclamation Era, March, 1925, p. 37.) At that time the penstock connections had not been anchored, and the reaction of the pumped water was great enough to force the units slightly out of vertical alignment, causing the turbine guide bearing to heat. Temporary  $1\frac{1}{2}$ -inch stay rods were anchored in the upstream concrete wall of the building and the units were pulled back into proper alignment. They operated satisfactorily in this manner until permanent pipe anchors were installed.

The new low lift units were put into operation in April, 1926, and have operated satisfactorily since that time.



Cavitation on Inside of Old High Lift Pump

The following table shows the comparative performance of the old and new pumping units:

Gate opening	Pumped water second-feet		Power water second-feet		Total water through plant second-feet	
	Old units	New units	Old units	New units	Old units	New units
0.5	100.1	72.3	323.6	101.34	423.7	226.02
.6	119.7	99.3	332.8	110.95	452.5	273.17
.7	128.4	121.4	348.4	138.86	476.8	331.44
.8	133.7	138.2	362.8	155.64	496.5	372.73
.9	136.4	147.1	372.8	172.63	509.2	405.40
1.0	138.6	152.4	373.4	185.51	512	427.79

Plotting curves of these results shows that when the new high lift pumps are delivering 45 second-feet and the low lift pumps 80 second-feet or a total of the 125 second-feet which is the water right belong-

(Continued on page 190)



## Points for the Farmer to Remember

By George O. Sanford, Superintendent, Sun River Project, Mont.

(From the Montana Farmer)

**T**WENTY-FIVE acres of beets yielding 18 tons per acre will give the same net profit as 200 acres yielding 11 tons per acre.

Ten acres of potatoes yielding 300 bushels per acre give as much profit as 70 acres yielding 150 bushels per acre. The 10 acres put 3,000 bushels on the market. The 70 acres put 10,500 bushels on. Why glut the potato market with 7,500 bushels that yield no profit?

Sweet clover will solve pasture problems and improve land at the same time.

A few cows and chickens will pay your grocery bill.

The practical way of improving your dairy herd is by the use of a good purebred dairy sire.

Alfalfa pasture with a little corn and skim milk is heaven for growing pigs.

Manure puts a profit in sugar beets.

Alfalfa and sweet clover are like great men—their influence is felt long after they are dead.

If you will put potatoes on alfalfa land and sugar beets on manured land, you will put money in the bank at harvest time.

Growing sugar beets or potatoes on good land is money making, but to grow them on poor land is always heart breaking.

Every farm should have a garden.

It is that extra bushel or ton above the cost of production that makes profit.

## New Reclamation Era Speeds Up Settlement

Mr. W. G. Ide, manager of the Oregon State Chamber of Commerce, has written to Commissioner Mead as follows:

"I think I have a new one for you in land settlement.

"On August 15, the New York Times published a story on Oregon's land settlement system, reproduced from the August number of the NEW RECLAMATION ERA. On September 7, we received a letter from Mr. Frank Haralson, 731 Franklin Avenue, Brooklyn, N. Y., stating that he is employed by an outside company in the office of the New York Times and heard

our telegraphic request for a copy of the Times and he became much interested and wrote for information.

"As a result of the information sent him he wrote on October 5 to W. G. Amos, secretary of the Lebanon Commercial Club, Lebanon, Oreg., relative to lands suitable for poultry farming and requested Lebanon advertising matter and a copy of the local paper. The letter was turned over to W. R. Alvin, a responsible realtor, for reply, who immediately submitted a 33-acre poultry farm.

"Upon receipt of information Haralson wired for photographs, stating that the description sounded good enough to buy unsight and unseen. Mr. Alvin sent photographs by air mail, together with a sale contract. Upon receipt of the contract Mr. Haralson wired the money from New York, the entire transaction requiring six days.

"I submit to you that this is land settlement up-to-date."

## Orchard Mesa Pumping Plant

(Continued from page 189)

ing to the district, 215 second-feet of power water are required, or a total of about 340 second-feet through the plant. When pumping 125 second-feet with the original units about 336 second-feet of power water were required, making a total of 461 second-feet of water through the plant. This is an indication of the improvement that has been made in the efficiency of turbines and centrifugal pumps in the past 18 years, and also shows that when power is developed at this site in the future and with the district using its full right of 125 second-feet for the Orchard Mesa lands, there will be an additional 61 second-feet of water available for power in addition to the diversion right of the United States for 400 second-feet for power development, amounting to approximately 500 additional horsepower.

## Carlsbad Cotton Makes Three Bales to Acre

Joe Yarbro, a water user on the Carlsbad project, New Mexico, is being congratulated on his wonderful cotton crop. Project Manager Foster states that he had a talk with Mr. Yarbro about the middle of October, and at that time Mr. Yarbro said that he would pick 33 bales from 9½ acres, or considerably more than 3 bales per acre. He had already picked 21 bales from 9 acres in two pickings, with a third picking to follow.

## Echo Dam Contract Award, Salt Lake Basin Project

Contracts totaling \$1,512,067.65 were awarded on November 8 for the relocation of parts of the Union Pacific Railroad tracks and parts of the Lincoln Highway, and for the construction of Echo Dam, on the Salt Lake Basin project, Utah.

The contract for the relocation of the tracks and highway was awarded to the Utah Construction Co., of Ogden, Utah, on a bid of \$386,969.90. The contract for the construction of the dam was awarded to A. Guthrie Co. (Inc.), of Portland, Oreg., on a bid of \$1,125,097.75.

The relocation of portions of the railroad tracks and highway is necessitated by the flooding of the present routes by the reservoir created by Echo Dam.

## Alfalfa Most Profitable Crop on Newlands Project

F. B. Headley, who is connected with the University of Nevada experiment station, explains why alfalfa is the most profitable crop on the average on the Newlands project. It costs \$7.18 per ton to raise. The total annual value of the crop of about \$1,000,000. Other crops are valued at about \$250,000. The items which enter into the cost per ton of producing alfalfa on the project are as follows: Man labor at 40 cents per hour, \$2.30; horse labor at 12 cents per hour, 78 cents; interest on investment, \$2.02; taxes, 38 cents; water charges, 35 cents; equipment, 52 cents; overhead and miscellaneous, 83 cents; total cost per ton, \$7.18. The value of the credits, hay and pasturage, realized from the above costs was found to be \$9.57 per ton. On some of the better farms at Fallon and Fernley the net return, above all costs, per acre was \$11.50.

## Shoshone District in Good Financial Shape

E. E. Roddis, district counsel, has forwarded the financial statement of the Shoshone irrigation district, from November 1, 1926, to October 1, 1927, which shows receipts of \$47,685.43 and disbursements of \$27,235.50, leaving a balance in the treasury of \$20,449.93. On November 15 the first half of the taxes levied for operation and maintenance during 1928 became delinquent and the district expected to receive approximately \$18,000 at that time.

## Riverton Valley, Wyo., Shows What Can Be Done

As reported in the local press, big yields on the average on practically all the farms in the Riverton Valley this year are the general order, but it has remained for William Madden to establish a record for barley production that will stand for some time, it is believed.

On a 3-acre tract last spring Mr. Madden planted 300 pounds of Treby barley seed. The crop was threshed recently and, although the grower expected a good yield, the figures showed that it was beyond expectation. To be exact, 342 bushels of barley was the crop realized from the 3 acres, or 114 bushels per acre.

Mr. Madden has recently completed the harvesting of his sugar-beet crop. He had planted  $12\frac{1}{2}$  acres, and the result showed an average yield of 15 tons per acre. This figure stands after all tare had been figured out. The sugar content is reported higher this year than usual, exceeding 17 per cent in almost every instance.

## Onion Diet Seems to Make Turkeys Thrive

The lowly onion is one of the best foods for turkeys, according to Mrs. F. Keith, turkey grower living on a 20-acre farm near Nampa, Boise project, Idaho, as reported in a recent issue of the Nampa Leader-Herald.



Wind River Diversion Dam, Riverton Project, Wyo.

"I raised 130 birds last year which netted \$10.27 per bird," says Mrs. Keith. "I started them out on sour milk and a little bran mash. Later they roamed over a rented stubble field.

"About the 1st of November an onion field was left with the onions piled and unsold, and the turkeys lived on this until the onions were gone. I have never seen such thrifty fowls.

"This year I will have about 150 to market. The estimated cost of raising a turkey is less than \$2. I believe the

industry is in its infancy in Idaho, and I am convinced that a use for onions, which have been rejected on the market, may be found in feeding turkeys. Of course, about two weeks before market time the onion diet should be discontinued so that it does not taint the meat."

**A**BOUT 25 prospective purchasers from Northern Colorado were preparing to make a trip to the Belle Fourche project with a view to buying farms on the project.



Irrigated Wheat on the Shoshone Project, Wyoming

## Reclamation Organization Activities and Project Visitors

**D**R. ELWOOD MEAD, Commissioner of Reclamation, gave a talk recently at the Harrington Hotel, Washington, D. C., before the Alpha Zeta Society, an honor society in agricultural colleges. Doctor Mead spoke on present policies in reclamation and also described his recent trip to Palestine.

R. F. Walter, chief engineer, made a field inspection trip during the month, visiting the Lower Yellowstone, Milk River, Sun River, Kittitas, Yakima, and Huntley projects.

Congressmen Louis C. Cramton, B. L. French, E. T. Taylor, and John Morrow spent two days on the Carlsbad project.

Senator Wesley L. Jones and Congressman Sam B. Hill were recent visitors on the Okanogan project.

W. G. Ide, in charge of settlement work for the Oregon State Chamber of Commerce, was a visitor on the Klamath project during the month.

Marshall R. Taylor, employed by the bureau from 1908 to 1925 as dragline operator and master mechanic, died on October 12 at Cle Elum, Wash. At the time of his death Mr. Taylor was in the employ of S. H. Newell & Co., one of the contractors on the Kittitas division, Yakima project. Mr. Taylor had been employed on the Umatilla, Klamath, North Platte, and Flathead (Indian) projects, and on the Sunnyside and Kittitas divisions of the Yakima project.

Lloyd Miller, president of the Yakima-Benton irrigation district, Sunnyside division, Yakima project, Washington, accompanied by N. C. Richards, are in Washington, D. C., for a few weeks in the interest of the project.

J. L. Lytel, superintendent of the Yakima project; Porter J. Preston, superintendent of the Yuma project; and Charles A. Engle, supervising engineer, Indian irrigation service, are in the Washington office in connection with the report on the recent survey of irrigation methods and practices.

Harold Conkling, formerly hydrographic engineer in charge of water supply

studies and investigations in the Denver office, has been appointed chief of the division of water rights of the State of California.

Samuel G. Porter, who received his early training in the bureau on the North Platte project, has been appointed chief of the Canadian Pacific Railroad Company's department of natural resources, at Calgary, Alberta, Canada.

Fredrik Vogt, member of the Norwegian Engineering Society, who is in this country studying arch dams, was a recent visitor at the Denver office.

Barry Dibble, former project manager of the Minidoka project, visited the American Falls reservoir recently.

George C. Imrie, assistant engineer, American Falls dam, has been transferred to the Kittitas division of the Yakima project.

B. E. Hayden, assistant reclamation economist, spent a week on the North Platte project, conferring with the various districts in regard to the 1927 crop census.

The Oregon State Reclamation Commission, comprising Governor Patterson; Sam Kozier, secretary of state; Tom Kay, State treasurer; and Rhea Luper, State engineer and secretary to the commission, visited the Warm Springs district, Vale project, recently and inspected the drainage ditches which have been built and the results obtained in lowering the water table.

Members of the joint legislative committee on water resources of California, accompanied by the State engineer and others, visited Stony Gorge Dam, Orland project, recently. These visitors included Assemblymen B. S. Crittenden, Van Bernard, E. C. Adams, and Frank W. Mixer; Senators H. C. Nelson and William R. Sharkey; State Engineer Edward Hyatt, jr.; H. M. Stafford, of the division of water rights; George C. Mansfield, of the department of public works; Roy C. Goodwin, of the Sacramento Bee; R. C. E. Weber, superintendent, Orland project; George Sturm, president, Orland Unit Water Users' Association; J. J. Flaherty, of the First National Bank of Orland; G. A. Barceloux, Bank of Orland; H. M.

Keene, editor of the Orland Unit; L. W. Wigmore, editor of the Orland Register; and C. A. Templeton, director, Orland Water Users' Association.

Among recent visitors to the Milk River project were Senator B. K. Wheeler, Congressman Scott Leavitt, C. D. Greenfield, agricultural agent, and A. H. Hoggland, consulting engineer of the Great Northern Railway.

President Sargent, of the Chicago & North Western Railway, together with the directors of the system and other official members, drove through the Lower Yellowstone project recently to view the industrial development and their new railroad to Vale. The party included three directors from New York and one each from Boston, Pittsburgh, Omaha, and Chicago.

Dr. F. L. Ransome, consulting engineering geologist, has completed his geological examination of Owyhee dam site.

C. M. Day, mechanical engineer, Denver office arrived at Boise at the end of the month to inspect the work being done on the balanced valves at Arrowrock dam.

D. W. Stuver and R. H. Fifield, engineers of the Puget Sound Bridge & Dredging Co., of Seattle, called at the Burley office of the Minidoka project to discuss plans for the development of the Murtaugh irrigation project. Other visitors were W. J. Martin, assistant supervisor of agriculture of the Union Pacific System, and George N. Carter, State commissioner of reclamation.

C. M. Day, mechanical engineer, and O. Greenberger, representative of the Worthington Machinery Corporation, have been conducting a series of tests on the pumping units of the Orchard Mesa plant, Grand Valley project, to determine the efficiency of replacement runners furnished by the company.

Recent visitors on the Yuma project and the Yuma Mesa included Senator Carl Hayden and Congressmen Cramton, French, and Taylor.

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# ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche.....	Newell, S. Dak.	F. C. Youngblutt.....	R. C. Walber.....	R. C. Walber.....	Wm. J. Burke.....	Mitchell, Nebr.
Boise <sup>1</sup> .....	Boise, Idaho.	R. J. Newell.....	W. L. Vernon.....	W. L. Vernon.....	B. E. Stoutemyer.....	Portland, Oreg.
Carlsbad.....	Carlsbad, N. Mex.	L. E. Foster.....	W. C. Berger.....	W. C. Berger.....	H. J. S. Devries.....	El Paso, Tex.
Grand Valley.....	Grand Junction, Colo.	J. C. Page.....	W. J. Chiesman.....	C. E. Brodie.....	J. R. Alexander.....	Montrose, Colo.
Huntley.....	Ballantine, Mont.	H. M. Schilling.....	J. P. Siebeneicher.....	.....	E. E. Roddis.....	Billings, Mont.
King Hill <sup>2</sup> .....	King Hill, Idaho.	.....	.....	.....	.....	.....
Klamath.....	Klamath Falls, Oreg.	H. D. Newell.....	N. G. Wheeler.....	Joseph C. Avery.....	R. J. Coffey.....	Berkeley, Calif.
Lower Yellowstone.....	Savage, Mont.	H. A. Parker.....	E. R. Scheppelmann.....	E. R. Scheppelmann.....	E. E. Roddis.....	Billings, Mont.
Milk River.....	Malta, Mont.	H. H. Johnson.....	E. E. Chabot.....	E. E. Chabot.....	do.....	Do.
Minidoka <sup>3</sup> .....	Burley, Idaho.	E. B. Darlington.....	G. C. Patterson.....	Miss A. J. Larson.....	B. E. Stoutemyer.....	Portland, Oreg.
Newlands <sup>4</sup> .....	Fallon, Nev.	A. W. Walker.....	Erle W. Shepard.....	Miss E. M. Simmonds.....	R. J. Coffey.....	Berkeley, Calif.
North Platte <sup>5</sup> .....	Mitchell, Nebr.	H. C. Stetson.....	Virgil E. Hubbell.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Okanogan.....	Okanogan, Wash.	Calvin Casteel.....	W. D. Funk.....	N. D. Thorp.....	B. E. Stoutemyer.....	Portland, Oreg.
Orland.....	Orland, Calif.	R. C. E. Weber.....	C. H. Lillingston.....	C. H. Lillingston.....	R. J. Coffey.....	Berkeley, Calif.
Owyhee.....	Nyssa, Oreg.	F. A. Banks.....	.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Rio Grande.....	El Paso, Tex.	L. R. Fiock.....	V. G. Evans.....	L. S. Kennicott.....	H. J. S. Devries.....	El Paso, Tex.
Riverton.....	Riverton, Wyo.	H. D. Comstock.....	R. B. Smith.....	R. B. Smith.....	Wm. J. Burke.....	Mitchell, Nebr.
Salt Lake Basin.....	Salt Lake City, Utah.	E. O. Larson.....	.....	.....	.....	.....
Salt River <sup>6</sup> .....	Phoenix, Ariz.	.....	.....	.....	.....	.....
Shoshone <sup>7</sup> .....	Powell, Wyo.	L. H. Mitchell.....	W. F. Sha.....	.....	E. E. Roddis.....	Billings, Mont.
Strawberry Valley <sup>8</sup> .....	Provo, Utah.	.....	.....	.....	.....	.....
Sun River <sup>9</sup> .....	Fairfield, Mont.	G. O. Sanford.....	H. W. Johnson.....	H. W. Johnson.....	E. E. Roddis.....	Do.
Umatilla <sup>10</sup> .....	Hermiston, Oreg.	.....	.....	.....	.....	.....
Uncompahgre.....	Montrose, Colo.	L. J. Foster.....	G. H. Bolt.....	F. D. Helm.....	J. R. Alexander.....	Montrose, Colo.
Vale.....	Vale, Oreg.	H. W. Bashore.....	C. M. Voven.....	B. E. Stoutemyer.....	B. E. Stoutemyer.....	Portland, Oreg.
Yakima.....	Yakima, Wash.	J. L. Lytel.....	R. K. Cunningham.....	J. C. Gawler.....	do.....	Do.
Yuma.....	Yuma, Ariz.	P. J. Preston.....	H. R. Pasewalk.....	E. M. Philebaum.....	R. J. Coffey.....	Berkeley, Calif.

## Large Construction Work

North Platte, Quernsey Dam.....	Guernsey, Wyo.....	F. F. Smith <sup>11</sup> .....	.....	L. J. Windle.....	Wm. J. Burke.....	Mitchell, Nebr.
Kititas.....	Ellensburg, Wash.	Walker R. Young <sup>12</sup> .....	E. R. Mills.....	.....	B. E. Stoutemyer.....	Portland, Oreg.
Sun River, Gibson Dam.....	Augusta, Mont.	Ralph Lowry <sup>12</sup> .....	F. C. Lewis.....	F. C. Lewis.....	E. E. Roddis.....	Billings, Mont.
Orland, Stony Gorge Dam.....	Stony Gorge Dam site, Elk Creek, Calif.	H. J. Gault <sup>12</sup> .....	C. B. Funk.....	.....	R. J. Coffey.....	Berkeley, Calif.

<sup>1</sup> Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.

<sup>2</sup> Operation project assumed by King Hill Irrigation District Mar. 1, 1926.

<sup>3</sup> Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1926.

<sup>4</sup> Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

<sup>5</sup> Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

<sup>6</sup> Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

<sup>7</sup> Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

<sup>8</sup> Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

<sup>9</sup> Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.

<sup>10</sup> Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.

<sup>11</sup> Resident engineer.

<sup>12</sup> Construction engineer.

## Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Cache la Poudre investigations.....	Denver, Colo.....	Thomas Hawthorne.....	Poudre Valley Water Conservation Association.
Middle Rio Grande.....	Albuquerque, N. Mex.	C. C. Elder.....	Middle Rio Grande conservancy district.
Columbia Basin Project.....	Lincoln, Wash.	B. E. Hayden.....	.....
Truckee River.....	Reno, Nev.	A. N. Burch.....	.....
Heart Mountain investigations.....	Powell, Wyo.	I. B. Hosig.....	States of North Carolina, South Carolina, Georgia,
Southern investigations.....	Washington, D. C.	George C. Kreutzer and C. A. Bissell	Florida, Alabama, Mississippi, and Tennessee.







